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DOCTORS DIFFER

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NORTHERN LIGHTS AND WESTERN STARS

THE INHERITORS

FINGAL'S BOX

AT CAPE FAITHFUL

HARLEY WILLIAMS

DOCTORS
DIFFER

Five Studies in Contrast

JOHN ELLIOTSON

HUGH OWEN THOMAS

JAMES MACKENZIE

WILLIAM MACEWEN

R. W. PHILIP



JONATHAN CAPE
THIRTY BEDFORD SQUARE LONDON

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To

BETTY

He was persuaded that no one serves
the generation into which he had been
born so well as he who offered it,
whether in his art or in his life, the gift
of certitude.

JAMES JOYCE

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The photograph of Sir James Mackenzie facing p. 128 is kindly lent by Lady Mackenzie. That of Sir Robert Philip facing p. 220 is the work of Mr. I. McConochie of Messrs. A. H. Baird, Edinburgh. The picture of Edward Livingstone Trudeau facing p. 236 is from Trudeau's *Autobiography* (Lea and Febiger, Philadelphia and New York, 1916).

PART ONE

PROLOGUE

PROLOGUE

REMBRANDT's sombre painting called *The Anatomy Lesson by Dr. Nicolaas Tulp* shows seven men in black habits and heavy lace ruffs gathered around a pale corpse on which the professor gives a demonstration, pointing to the loose tendons of the forearm. The faces of seven students catch the light as they crane forward to stare down at the specimen, or up at the lecturer's face, and each expression is different and individualized. We shudder at the stark realism of that dead body, and our interest fastens on the dark-eyed students who crowd around, concentrated upon the remains of what was a man, and is now only an anatomical object on which the teacher in his wide black hat bestows a casual academic glance. They are surgical apprentices, and on their faces burn seven personal flames of dedication. Wearing their frilled lace collars, they are lively, emotional, thoughtful — seven versions of the same passionate curiosity. On their faces we see thoughts coming to birth, inquisitive musings on the mystery of that dead human form, methods of surgical treatment, case histories, sick men and women, professional fame, fees. To the world, those young surgical practitioners seem to say — this dissected limb that lies before us may seem gruesome, but we are superior to such feelings, we are explorers, probing the central secrets of human life. These seven men of the Amsterdam Surgical Guild were indeed pioneers of a new science of anatomy, only recently opened up. It had once been studied in hiding, but was now a public spectacle. Dissection had become the penalty of Conviction, as only the bodies of criminals could be anatomized, and this pale corpse had once been a malefactor who was hanged. That prim teacher himself belonged almost to the first generation permitted to dissect the human body first-hand.

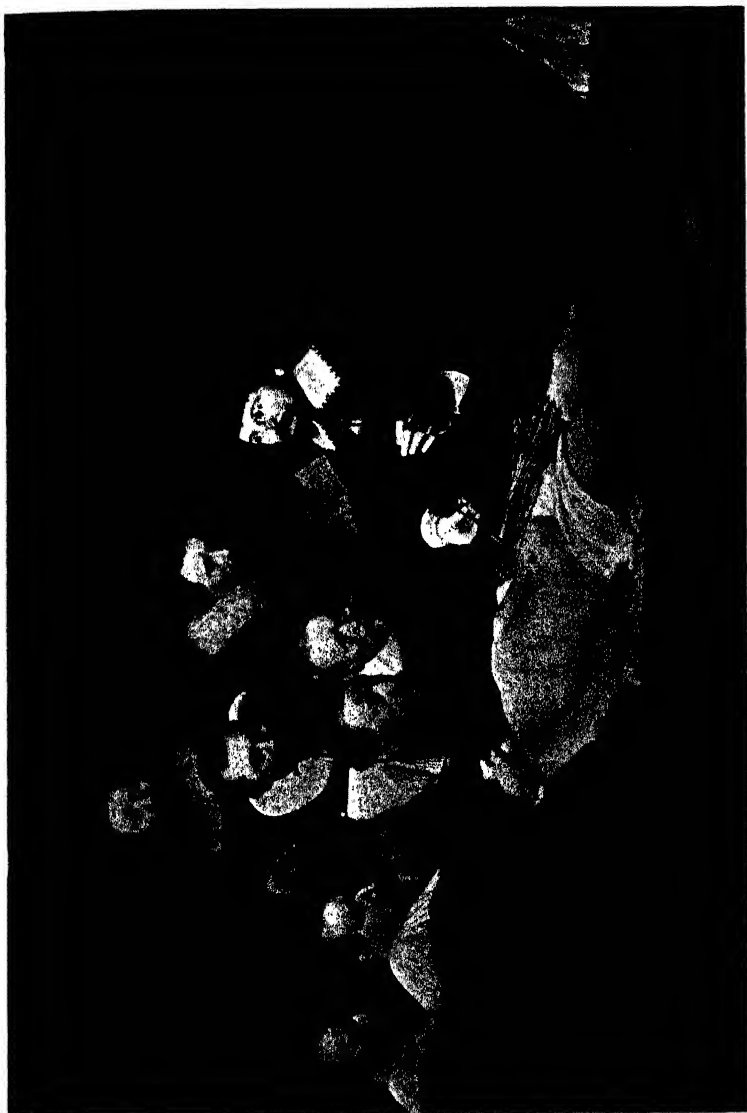
DOCTORS DIFFER

Anatomy, the form of the human muscles, arteries, nerves, was something strange and fresh, it was glorious, and to them it seemed to hold the future of the healing art. With this picture the young Rembrandt first made his reputation, and he has drawn the surgeons as he saw them in life, each separate face reflecting the glow of eager illumination at contact with the new.

It is difficult, three hundred years later, to share that enthusiasm for anatomical facts — names and positions of muscles, organs, nerves — such things have become as dry and insufficient a basis for understanding human life as knowledge of the laws of harmony is inadequate to explain the melodies of Chopin. Their eager eyes are focused on the dead, while to-day medicine is concerned with life and health. The magic has gone out of dissection, and the faces of medical students to-day reveal no such reverence for anatomical memoranda. The magnetism drawing young minds to the unexplored has passed from deadhouse anatomy — the study of form — to physiology, and more recently to psychology, the science of the mind and spirit. The medical horizon has immensely widened. There is no end to knowledge of our human species, always at war with either itself or its environment, and the doctor of to-day must keep changing his point of view, throwing away old methods, yet never losing that primitive faculty of wonder seen in the seven faces of Rembrandt's picture. The essence of medicine lies in that direct quality of humbleness before the human mystery, rising above disgust and embarrassment, to sympathy.

The picture of the 'Anatomy Lesson', painted in 1630, marks the end of one period in medicine, and the beginning of a new epoch that is not ended to-day.

Before Doctor Nicolaas Tulp, for more than a thousand years, medicine had been concerned chiefly with Soul. To the classical Greeks, Spirit was more vital than Flesh. But since the Renaissance, once the ban against dissecting the human body was removed, the actual shape and size of the physical



THE ANATOMY LESSON OF DR. NIKOLAAS TULP

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organs, and similar facts of pure materiality became all-important. It is only in our own day, that mind and spirit are returning once more to the art of healing.

Since we must all die, the battle of medicine is a losing one, but it has great triumphs and greater aspirations. It is the means by which organic life keeps a secure hold on this planet. Through it alone does human adaptation become possible, whether we choose to live in a tropical forest, or shoot across the stratosphere. Medicine, alas, can make warfare safer, but medicine can also make peace more secure. While it preserves the means by which millions thrive, medical art cherishes the individual. It can lighten labour, set life free from strain, and generally soften the harshness between the human mechanism and that inexorable machine called civilized life. Yet with all these collective triumphs medicine has to learn patiently from each single patient.

The currency of the phrase DOCTORS DIFFER forms a justification for telling of the lives of some characteristic members of the calling. These examples of medical diversity will suggest that medicine is still very much less of a science than in this mad scientific world we are encouraged to believe.

It would be a bad day for the sick and ailing amongst us, and eventually of course for healthy ones too, if any method were to be found of making doctors uniform in their outlook. Being ill is the last refuge of our human weaknesses, and we should be in a poor way to cure or prevent disease if our doctor were not also a deeply experiencing individual, with insight as well as knowledge.

Because of his daily obligation to deal with the fears, whimsies and prejudices of sick people, as well as the complex details of modern treatment, the practising doctor does not like to be organized, and prefers those intuitive methods which he understands, rather than something else which he might admit to be a less imperfect way of ordering his professional life. He mistrusts uniformity, and he blanches at the need for planning. He feels that our fundamental inability to do things in medicine

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masquerades as a desire to plan how they ought to be done. For the aim of medicine is to keep in contact with the enemy disease, and the truth is that this can be achieved by innumerable different ways, by methods that cry out contradiction at one another. Doctors differ that the art of medicine may prosper.

The fascination of a doctor's calling lies in this need to keep his heart and mind perpetually in tension in the war with fate. The primary purpose of his art is to give that sense of certitude which is the first thing the sick man asks for. And to-day the whole world is sick, asking to be cured of its malaise, and much of our preoccupation with the reform of medicine is symptomatic of a latent human desire to be healed and restored in a sense beyond the power of a physician. But let that pass. This book is not a thesis on medical politics, but a collection of representative pictures of memorable doctors.

The five figures in this medical portrait-gallery all belong to the last hundred years, and in their professional lives were fought out some of the decisive battles in our long cyclical war against disease and death. Each of the biographical subjects personifies a whole branch of medicine, and as the chapters were being written, and the background to each figure composed out of the material of his epoch, a second personality began to emerge, like the shadow insistently appearing in a spirit photograph. Sometimes this biographical counterpart had heralded the principal subject, but often he differed from him and demanded to have his dissent recorded. Their opposed lives show that though they followed the same medical specialty, the integrity of each was inviolable and professionally they were by no means in accord. Once more the jibe about differing doctors is justified. Yet such a stereoscopic picture of the subject-matter as seen through differing angles of vision is more significant than the uncomplicated but narrow viewpoint of a single mind. They are not antagonistic, they are complementary.

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The chapters which follow are lives, not biographies, and the five figures are presented as *agonists*, fighting a battle to strengthen the whole human hold on life. With personalities like these excessive veneration can be avoided, and worldly distinctions, degrees and honours minimized in face of their true achievement.

It has been said before, and cannot be said too often, that the surest path to understanding of another person's nature lies through the mystical rule of individual sympathy. It is the method of the artist, and equally the necessity of the doctor. The element of faith in curing disease is no less vital to-day than ever, and the doctor's problem is to kindle in the patient this ancient and operative trust, yet combine it with scientific medicine.

We may risk saying that the secret of why doctors differ is to be found here. To be successful with his patient, he must first resolve within himself that dualism of faith and science, somehow blending and reconciling them, and then organize his own powers for the supreme object of raising the patient's spirit to the height of certitude needed for cure. Thus, each good doctor finds his own individualistic way of achievement, and for each the way is different.

These five medical explorers set out alone in tiny boats on the stormy sea of human suffering. Let them speak for themselves, and tell why in that wide uncharted waste each of them followed a different course.

PART TWO

JOHN ELLIOTSON (1791-1868)
HIS TRIUMPH AND HIS DEFEAT

JOHN ELLIOTSON

THE discredit of John Elliotson forms a single brief engagement in the eternal warfare of spirit versus body. The conflict between them is one of the essentials of medicine, and victory on the one side means defeat of the opposite. John Elliotson represents the power of the human soul to quell disorder in the body. He attempted to revive those ancient powers through which primitive man spoke voicelessly with his tribe. He failed, because he was born both too young, and too old; too young to anticipate the union between body and mind which modern psychiatry has discovered once more; too old to assert the influence of spirit in the materialistic Victorian Age.

Now forgotten are those legitimate achievements in clinical medicine which came before his disastrous swerve towards psychology, only a hundred years ago. His page in medical history contains but one reference — his notorious failure to convince his own generation that the unknown spaces in the soul of man are worthy of study with scientific precision. This is a grave injustice to a remarkable man, one of the eminent Victorians.

John Elliotson, the first holder of a medical professorship in the University of London, pitted himself against his profession, and in the struggle fell short of that certitude which might have been his greatest service to his own age and ours. His fall condemned the science of Psychiatry, a prematurely born infant, to an early decline. After him regular medicine turned away from mind illness, and mental hospitals remained depressing barracks where the aim was more the segregation of the invalid than his study and cure. The entire mass of neurotic and functional illness, said to compose one-third of ordinary medicine, was completely ignored. Such were the consequences of John Elliotson's failure, and one grieves to think of the lives of so

JOHN ELLIOTSON

many sick people, and the delicate origin of a new branch of medicine depending so crucially upon one man's limitations.

His career reveals the fierce power of orthodoxy in medicine, and the violent antagonism which can arise between the human spirit and the physical body. In this conflict, John Elliotson is on the side of mind, and a certain Thomas Wakley, an Editor and Member of Parliament, personifies the blunt influence of rationalistic medicine.

The fates mistrusted Elliotson. He should have achieved so very much more. The bare facts of his life are increasingly hard to come by, and he has missed the biography which is the reward of some less eminent, but more eminently dull figures in the history of medicine. We shall try to do justice to his memory, and at this distance of a hundred years find some laurel leaves to weave into a posthumous crown.

2

APPRENTICESHIP

He was born in 1791, the son of a prosperous druggist dwelling on the south side of the Thames, whose warehouse was not far from one of the leading medical schools. Young John grew up in the expectation of becoming a physician. At the beginning of last century Medicine was largely the practice of 'Physic', the art of dosing with herbs, drugs and potions, both vegetable and mineral. As long as there have been men, there have been doctors skilled in this primitive art, and the action of such things real or fancied, on the human body. What we call scornfully 'the bottle of medicine habit' is based on deep human beliefs that a remedy for every disease exists in the fruits of the soil — pods, berries and leaves — and in the potencies of 'earths' and ores — iron, mercury and lead. This was the kind of materialistic atmosphere in which John Elliotson grew up in



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the wealthy druggist's home at Southwark. His first ideas of medical treatment lay in the narrow quest of new uses for old drugs and fresh drugs for old diseases.

After being prepared in the Classics by a local clergyman he was sent, at the age of fourteen, to Edinburgh University, then at the height of its fame, to pick up some academic medicine. As a graduation exercise he composed in Latin the volume of fifty-six quarto pages upon Inflammation (*de inflammatione communi*), his first offering to those anonymous scribes who supervise the card index of fame. It is a jejune work, of course in Latin, made up of opinions and ideas of others, commencing with fulsome dedications to the Principal of the University, to Alexander Monro (Secundus), the great anatomist who taught him, and to Sir Astley Cooper, the surgeon of Guy's Hospital; it opens with a quotation in Greek from Plato's *Phaedo*, and ends appropriately with lines from Cicero's essay on *old age*. According to the fashion of the time the thesis is more a literary production than a contribution to medicine.

In 1810, when John was nineteen, and had graduated in Edinburgh, he went up to Jesus College, Cambridge, to finish his education. Nowadays we should reverse the process and the vocational training in medicine would come after the general education and not before. He learned German while touring continental schools and he was thus a cultivated young man when he came back to London and started a practice. Since medicine was practically a branch of archaeology, Elliotson with his classical education was exceptionally well trained for the profession, by the light of his times. He settled down in the neighbourhood of the Borough; that congested portion of Thameside south of London Bridge which has since steadily deteriorated from village to riverside slum. Near at hand were the united hospitals of Guy's and St. Thomas' which then formed a single medical school.

In 1820, schools of medicine were hardly respectable. Their methods of obtaining bodies for dissection were highly questionable and sometimes criminal, their curriculum was sketchy. So

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great was public horror of dissection that the authorities of Guy's put up a reassuring notice on the gates that no *post mortem* examinations would be held in the hospital. New academies grew like mushrooms. One young surgeon who could not afford the fee required by Sir Astley Cooper for a teaching post at Guy's, started an anatomy school of his own in a room off a tailor's shop, and when his pupils increased, moved to a disused chapel. The teaching of medicine was organized through private enterprise. Any brilliant teacher who could find money enough to build a lecture theatre could advertise his course in the newspapers and count on a regular audience of two hundred pupils. The famous Dr. Addison, who first described Pernicious Anaemia, made £700 a year from his lectures alone.

As John Elliotson lingered about the courtyard of the hospitals another youth, also named John, a student only five feet high, with dark brown eyes and golden reddy-brown hair, carried his instrument box and made anatomical notes from the words of Sir Astley Cooper in his high lecture theatre. This was John Keats who was to perish of tuberculosis in the year Elliotson took his Cambridge degree. Those two medical students of the United Hospitals represent opposite poles of the human spirit. The doctor was to live another forty years, the poet to live for ever, but both of them retained ever afterwards the impression of that squalid life in the Borough, dissecting bodies brought by Resurrection men, watching surgical operations that were phantasmagoria of horror, passing along the line of patients to perform the routine annual service of drawing off two pints of blood to give health for the summer season. A famous line in English poetry was conceived in a medical student's lodging near St. Thomas' hospital when John Keats wrote in his notebook: 'a thing of beauty is a constant joy', and then by sudden inspiration, altered it to the form we know.

Young Dr. John Elliotson aspired to become a teacher in his own hospital, and showed himself capable of clever strategy, but rather clumsy tactics, when a vacancy occurred for the office of assistant physician to St. Thomas'. He was twice

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passed over, but eventually appointed. Then in 1823 when he was due for promotion to the higher rank of a full physician, as was the custom, his enemies in the hospital got busy, and put up a dummy candidate against him. To this manœuvre Elliotson's father, who was a powerful influence with the lay hospital governors, replied by canvassing his friends, and when all the big guns had been brought up, his son was duly appointed, now physician to the hospital — but with the curious restriction of not being allowed to lecture there. There was a reason for this. Before the election and while waiting for the appointment, Elliotson had moved a little too smartly for his senior brethren.

He had developed a taste for medical jurisprudence, the legal side of medicine, and the medical aspect of criminology — then novel subjects and not taught at the United Hospitals. His vivid lectures became very popular, much to the disgust of the established teachers among whom the leading figures were Sir Astley Cooper and his kinsman a surgeon called Henry Cline. Astley Cooper, the idol of medical students, was full of ingenious resources and striking illustrations, and even at the back of the lecture theatre you could not help listening to him and watching his clear demonstrations. It was said he could operate as well with an oyster knife as with the best bit of cutlery in an instrument-maker's shop. Cooper and Cline were actually proprietors of the hospital lecture theatre which they had built with their own money, and had thus acquired virtually absolute power of appointing or vetoing the other teachers in the school. Astley Cooper could at least keep the pushing young man out of the lecture theatre.

There was an exchange of broadsides between Elliotson and the hospital authorities, and at one meeting the Governing body passed a resolution expressing its regret that Dr. Elliotson had not addressed their officer in 'language more temperate and decorous'. Unable to expand his favourite subject inside the walls, he was obliged to deliver his lectures in a private medical school run by the brothers Grainger near at hand, and here the

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success of his vigorous teaching made him more enemies inside St. Thomas' hospital.

The staff election of the full Physician came on, and much to the discomfiture of the rulers of the school, the dummy candidate chosen by themselves failed. Outmanœuvred upon their own ground, the ruling powers gave in, and offered Elliotson the appointment — but on condition that he gave up his successful course of lectures at the Grainger School across the road. He must become a St. Thomas' man wholly, or not at all, and being very keen on the appointment, John Elliotson was obliged to agree to give up his extramural lectures in the middle of the course.

Once elected to the medical staff, however, he managed to turn the tables on his opponents: he lobbied the managers of the hospital to such effect that they summoned a special meeting, and formally absolved him of his promise not to teach outside the hospital, and dramatically tore up the document which he had signed to that effect.

The objection which the senior teachers of the United Hospitals took to his lecturing at the Grainger School, and their slow welcome to his aspiration to join the hospital staff was not mere professional exclusiveness, it was bread and butter, it was snuff and claret. This popular lecturer was an outsider, breaking in to a very lucrative business. A hundred years ago, the fees which medical teachers received were handsome, and the established ones were not inclined to throw away their monopoly. Sir Astley Cooper and Henry Cline, the joint potentates of the United Hospitals, made new appointments and divided the fees: naturally they filled vacancies with their nephews, sons, cousins and protégés.

The ruling powers of the United Hospitals had proved quite unable to prevent John Elliotson's entry, and before long he settled down into a very prosperous connection. Soon his enterprise was to seize hold of a new feature of medical teaching which was in Elliotson's day as sensational as the advent of broadcasting has been to ours. The beginning of his medical

COBBETT'S PUPIL

career brought him into contact with another graduate of the United Hospitals who became first his friend, and later his implacable opponent.

3

COBBETT'S PUPIL

This man Thomas Wakley was a very different type from John Keats and even Elliotson himself. Wakley was a Devonshire yeoman's son of unbelievable pugnacity, and after he qualified as a member of the Royal College of Surgeons in 1817 he settled in practice in the West End of London, where his house was burned down in mysterious circumstances connected with an outbreak of mob violence and through no fault of Wakley's. His indignation burned, and he remained on fire for the rest of his life. This episode led him away from a settled medical career and towards journalism. He started a medical magazine, *The Lancet*, in reverent imitation of William Cobbett whose *Annual Register*, notorious for its hard hitting style, is the ancestor of two very dissimilar publications still appearing to-day, namely *Hansard's Parliamentary Debates* and *John Bull*, although in the latter case the ancestry is only spiritual.

Wakley's new journal, *The Lancet*, was an immediate success, and the momentum he gave it was very strong, for to this day a hundred and twenty years later the direct descendant of that first number appears every week from an address not half a mile away from the house off the Strand in London where its progenitor was conceived in 1823. Wakley would have had just cause for pride in the vitality of his journal. Thomas Wakley's patent of success was the discovery that medical students and doctors were willing to pay sixpence a week to read reports of lectures given by the hospital teachers instead of large fees for

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actual attendance, and before long he became notorious not only for purveying the information which the great clinical teachers might have been glad to make public, but also their mistakes, their inconsistencies, politics, and even their personal asides breathed informally in their hospital wards and certainly not intended for a wider audience. *The Lancet* exclusive series of medical lectures opened with weekly dissertations by Sir Astley Cooper, Bart., the King's Surgeon. Cooper's reputation was too secure for the publication to do him any harm, but other teachers haled Wakley before the Courts. No surgeon felt himself safe, for Wakley also printed eyewitnessed accounts of surgical operations and had no hesitation in describing this man as a bungler, and that surgeon as guilty of malpraxis. In 1823 the language of controversy was more extreme and the Law of Defamation less tyrannous.

In spite of this latitude of the law it was not uncommon for Wakley to be sued for libel and faced with a claim for damages of £2000. During his first ten years as Proprietary Editor of *The Lancet*, he was defendant in ten such actions. Frequently he won his case, but even when the verdict went against him he had a happy knack of calling a meeting of his friends in the Freemasons' Tavern where an excited concourse wrought to fitting pitch by his eloquence would subscribe hundreds of pounds to meet his bill of costs.

Wakley was a vigorous pamphleteer, unhampered by modesty, and with a profane disregard of other people's dignity. He thus describes one of those august functions at which the Royal College of Physicians honoured William Harvey: 'The Harveian oration consisted of the usual twaddle uttered on such occasions. The meeting ended in a jollification and the proceedings have been duly recorded in the theatrical portion of the columns of the daily journals.' Wakley was no more indulgent to the leading personalities of that august College: 'The influence of Sir Henry Hallford is on the wane. The slippery nose, which used to penetrate into every medical sanctuary with impunity, is now receiving some painful pinches

MEDICAL TEACHER

between doors and architraves.' This happened to refer to the President. Wakley's regular term for the senior surgeons of London was 'the BATS', on account of their habit of working secretly and the power of their claws. In the pages of *The Lancet* the headquarters of the Society of Apothecaries is always 'Rhubarb Hall', and the Royal College of Surgeons is referred to as 'the Diploma Warehouse in Lincoln's Inn Fields'.

The Lancet never lost a chance of tilting at the landed aristocracy and on another occasion had some tart things to say of the way Lord John Russell gave the prizes to the students of London University. 'It is an error to say that the prizes were presented to the students. . . His Lordship . . . never placed any of them in the hands of the young men but . . . gazed vacantly at the student, wagging his under jaw to the tune of some disjointed and unintelligible sentences, laid the medal and certificate half-way between him and the pupil and resumed his seat without even shaking the gentleman by the hand.'

Wakley believed he could advance the cause of medicine by polemics, hard-hitting and scurrilous personal abuse. But he also introduced sound and accurate reporting, graphic presentation of issues, and catholic, diverse interests. His style was much more that of an American Crime Reporter to-day than the wise, temperate and still more influential weekly which Wakley's *Lancet* has now become.

4

MEDICAL TEACHER

Such was the man whose new journalism laid the basis of John Elliotson's professional success, and was afterwards to play a powerful role in pulling it down. Wakley printed Elliotson's medical lectures frequently, and in full, and far from bringing an action against the Editor, or objecting to the publicity,

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Elliotson seized every possible advantage from it. Whenever he spoke to an audience of students he was careful to see that the *Lancet* reporter received every attention, and afterwards he called in at Mr. Wakley's editorial office to correct the proof.

In those years Elliotson really was making medical history. This is the part of his career which should be given more prominence in the history of nineteenth-century medicine. He was always ready to exploit a new hint of some fresh drug, or make use of a novel instrument. He seized on that hollow wooden tube, the stethoscope, invented by Laennec in Paris. Elliotson classified afresh the sounds of the heart and lungs, and preached the value of the instrument to the scorn of the older clinicians at Guy's and elsewhere. He also extended the method of tapping with the finger called Percussion, to find out the physical state of organs inside the body. He gave very large doses of drugs, and made several valuable observations on their use. He discovered that the animal disease Glanders can be transmitted to human beings. He was much influenced by the theories of Franz Joseph Gall whose doctrine of the human faculties survives to-day only in the degenerate form of 'bump reading', by which particular qualities are supposed to be located under hillocks and depressions in the surface of the skull.

Among Gall's notions and flashes of insight was one of startling originality which prepared Elliotson's mind to receive later impressions.

Gall believed that human 'passions', meaning joy, sorrow and fear, are felt by the mind independently of the will, and that these 'passions' are capable of causing the body to perform acts which the will and consciousness know nothing about. That is to say, 'passions' are classed with the instincts, and as we should now say are 'below the threshold of consciousness', a remarkable anticipation of Freud's discovery of the unconscious mind. Elliotson also translated from the German Blumenbach's textbook of Physiology which became a standard work. He gave the Lumleian lectures at the College of Physicians on diseases of the heart. He was a restless and industrious consultant, but

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not exactly popular among his hospital colleagues, though he gave some fine musical parties.

He ruffled the pride of his brethren of the College of Physicians by the reprehensible innovation of wearing trowsers — that is, he gave up the knee-breeches and silken stockings through which the older physicians sought to keep their link with past times; he even began to affect side-whiskers, which, to some, argued a very radical tendency. Moving restlessly in and out of his carriage, across London between patients' houses and the hospital, entertaining the world in his drawing-room, walking with a limp, the relic of a fracture while on a visit to Germany, he was a hardworking and much sought after consultant. He had a straight nose, black eyes and raven hair, and on account of his complexion and his undoubted brains, report declared he was a Jew. His students paid him the highest compliment that can be given to a medical instructor. It was said that *he did not lecture, he taught*, a vital distinction which separates the speciously lucid talker from the man who is able to communicate his learning in such a way that it pervades the listener's mind and tends to stay there. At this early period of Elliotson's professional life Wakley described him in *The Lancet* as 'a very delightful fellow in general society who holds interesting medical conversaziones, gives splendid musical parties which are attended by the first medical professors in London — and finally, in all his words and actions, a happy exemplification of that "noblest work of God — an honest man" '.

Elliotson was nearing the height of his success when he was invited to take part in a new venture — an academic medical school, part of the new University College, the nucleus of London University.

This 'Godless institution in Gower Street', as its clerical enemies called it, had been discussed for a quarter of a century before the foundation stone was laid in 1827. The College was the stronghold of non-religious and laical education, a non-denominational reaction to the traditions of Oxford and Cambridge where the thirty-nine articles and Church of England

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membership still prevented dissenters from taking degrees. A hospital attached to the new college was started to provide medical teaching on new principles. In the other London schools the students picked up anatomy and a little chemistry within the hospital walls. But at University College Hospital they were to study for medical degrees and in the academic atmosphere where literature and philosophy flourished. University College Hospital was the first in London to follow the Scottish system of making medicine a University study. For even Oxford had not progressed beyond the days when the only duties of the Regius Professor of Physic were to read a lecture twice a week, and supervise the performance during the Lent term of a dissection 'if the execution of a criminal happened opportunely'.

Incredible as it now seems, voices were heard in the academic world saying that medicine could be taught in a college having no hospital. For some years there was indeed no clinical instruction at University College, but owing to the persistence of Elliotson and others, the hospital was eventually built and soon became famous. It was called the hospital of 'all the talents'. The fact that the Governors selected John Elliotson as their Professor of practical medicine shows how highly he was regarded, and the lectures which he had given to large audiences south of the Thames were now delivered in the new lecture theatre of the College in Gower Street.

On training medical students Elliotson took liberal and sensible views. Like every gifted teacher who can be sure of attracting students upon his own merits, he was opposed to compulsory attendance. He believed that the examiners should decide what they expect the student to know, and allow him to gather knowledge in his own way. He did not even favour compulsory dissection of the dead body, believing that the examiner would soon find out whether the student had actually gone through the labour of learning his anatomy in the practical way. The only part of the curriculum he insisted upon was actual attendance at the hospital.

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His opening address as Professor dealt with the novelty of teaching medicine in a University, although the idea was commonplace at Scottish and continental academies. He said the usual method of medical education, a five-year apprenticeship to an older doctor, was a waste of time, for in those years a youth should be studying languages and philosophy. The modern ring, its candour and freedom from professional cant, made Elliotson the kind of teacher whom young men like: 'I determined, however long I might wait for success, never to fawn upon my superiors, nor to stoop meanly to my inferiors; never to intrigue for an advantage, nor to employ trumpery artifices for making myself known.' For ten years this policy kept him poor, until *The Lancet* began to publish his lectures thereby doubling his practice. As further lectures were printed, the professional connection was again doubled, and still again. This success was due to the general practitioners to whom he pays a tribute — an amiable and diplomatic gesture from a professor of medicine.

Some of Elliotson's power as a teacher remains even to-day, and we see the clear mind of the great physician, his almost too great belief in drugs, wine, leeches, poultices, and meticulous calculation of the amounts of milk and beef tea to be given to the patient. He always emphasizes the importance of correct dosage — neither too much nor too little, but proportioned to the disease and the constitution. Taken down practically verbatim these lectures made a great impression when they appeared in *The Lancet*, and even to-day, in spite of the limited value of the treatment, we can picture the doctor speaking, a sincere and thoughtful man who has observed much, and is both self-confident and humble.

It was true that he had the reputation for giving unusually large doses of drugs, a habit which made some fellow practitioners nervous, and his critics were inclined to say: 'Let Elliotson diagnose the disease, but don't allow him to prescribe treatment.' They also said his methods of diagnosis were painfully slow.

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That was the penalty of his growing professional renown, and the wearing of trowsers in place of knee-breeches, his Victorian whiskers, and his giving up the gold-headed cane so long the mark of the medical consultant still further increased his singularity.

John Elliotson's ambition was to make University College a great school of clinical medicine, that is a centre where students would be taught at the patient's bedside, rather than in lecture rooms. His own instruction was practical and very personal and he was always ready to seize upon a new instrument such as the stethoscope. Each evening except Saturday during the University session, he gave his lectures in a crowded room, and three days a week the young men followed him round the wards at one o'clock. Surely that record of teaching medicine will compare favourably with any professor to-day. One final touch to his popularity: he reduced his fee to five pounds and tried to persuade other professors to follow his example. They hesitated, and some refused, and John Elliotson was compelled reluctantly to go back to the regular fee of six pounds because his courses lost prestige owing to their cheapness.

Such a man becomes a force in any medical school. For a time, his ideas are resisted. Gradually he is tolerated, becomes popular, and eventually he transforms the whole of the institution. John Elliotson's early years as a consulting physician and clinical teacher show this hard-thrusting manner of pushing his ideas. No doubt his colleagues, who said he was too impatient and ambitious, were right, and among the traditions which have gathered around him there is one which deserves mention. Elliotson is supposed to have said that he hated his profession. This explains a great deal of what is to come.

He had the misfortune to be born just before one of the great transitions in medical history. When he became Professor in 1831, there was no microscopic anatomy, anaesthetics were not used, and the germ theory of disease was half a century away. Public Health, except as a minor branch of forensic medicine, had never been thought of, and of course there were no vaccines,

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serums or electrical treatment. Psychological medicine was almost a hundred years in the future, and systematic nursing and scientific dieting were unknown in the treatment of disease.

His experimental mind had come to a point where he had exhausted the possibilities of what medicine could do, and at the height of his fame, when his talents had been recognized and professional honour conferred on him, John Elliotson felt a sense of staleness and repetition. His reputation for advising large doses of medicines suggests that he was fretting to burst through the confines of the possible, and explore something beyond. He had been professor of medicine only a few years when the opening came. He was psychologically prepared for a revelation, and it appeared from an unexpected direction.

This man, highly thought of as a progressive but orthodox physician, was over forty when he was prompted to look over the edge and explore the infinities of the mind. He had reached the limit of what could be accomplished through medicines and physical examination of the organs. His impatience suddenly found a way out when he realized the boundless potential knowledge of the feelings of sick people, those changes which disease causes in the personality, and vastly more difficult to appreciate than organic diseases in the heart or the liver. In modern language, John Elliotson woke up to the fact that Psychiatry — the study of the sick mind — is the other half of medicine, and that bodily illnesses have their hinterland of mental features.

To understand how he acted in response to this new illumination, we must take a backward survey to this new knowledge which so fascinated him — the science of mesmerism or animal magnetism, just over half a century old.

This historical glance will show that John Elliotson's conversion to the power of mental operations in the cure of disease repeats what had happened before. There is something eternally fresh about these hopes of influencing the mind. They burst forth in each generation and pass, after a harsh spring and brief summer of acceptance, into an early and blighting winter.

Mesmerism is called after a remarkable man.

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Anton Mesmer (1735-1815), the Columbus who found a new continent of psychological medicine, was a dilettante philosopher and *amateur* of Science in that brilliant Vienna when Mozart was alive. One day, Mesmer heard by accident that some doctor's patient who suffered from an abdominal disease of some kind had been cured by having an ordinary magnet of iron passed over his body. Mesmer, who was a doctor of medicine as well as of philosophy, and anxious to try everything new, made experiments with a similar piece of bent iron, and found he could cure people of all sorts of conditions. And not only that. He could 'magnetize' a piece of wood or a glass of water, and the person touched with the wood or drinking the water became cured in the same way as if he had been touched by the magnet itself. Starting with these crude methods, Mesmer began to heal patients on a large scale. They flocked to his salon, they sat in tubs of 'magnetized' water, and wearing long robes and waving a magic wand, Anton Mesmer walked amongst them, increasing the effect of the treatment by his presence, his tall hat, and strains of hidden musical instruments. Mesmer was no quack but a genuine discoverer and searcher for an explanation of the remarkable cures he produced. He reasoned that the influence which his magnets had on the patient must be due to a hypothetical 'fluid', an invisible force passing from his own body through the piece of iron, similar to ordinary magnetic attraction, but working at a much greater distance. But as his experience increased, he found that the same excellent results could be produced *without* the iron magnet. For instance, he had only to lay his hand on the patient, or stroke gently the part affected, for very extraordinary relief to be given. Thus Mesmer began to argue that the 'fluid', whatever it was, came not from the electro-magnet, but from himself — from his nerves, his brain or his 'will'. It was not

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ordinary electrical force, it was personal, it was indeed '*animal magnetism*'. Mesmer's great discovery did not fully explain itself: it remained mysterious even to the discoverer. But the same results were produced by many others, his pupils and intimates, and were facts beyond dispute, though academies of medicine in Vienna and elsewhere denied them.

Not that the actual relief of the sick man's symptom was the first or most obvious consequence of the Mesmeric treatment. The earliest effect was generally a violent convulsion, a shaking, painful crisis of the whole body, after which the patient usually fell asleep. As one subject passed through this convulsive phase in Mesmer's large consulting room, the effect was apt to be communicated to others, and a special room was kept called '*La Salle des Crises*' where the patients could sleep off the seizure, after which they felt much better. Mesmer encouraged these physical storms, which were so infectious among his clients, believing that through them a discharge of harmful mental energy took place.

Then there was his famous handling of Maria Theresa von Paradis, a girl in her teens who had been blind since she was three years old. She was a musical prodigy, and her father was in the suite of the Empress Maria Theresa. The girl came under Mesmer's treatment, and after some weeks of '*Animal Magnetism*' she was able to see dim outlines, and gradually could tell the difference between daylight and darkness. Presently as her vision continued to improve she went through the psychological readjustment of seeing for the first time and with an adult mind external objects that before existed only in her imagination. Not surprisingly this process was painful to her, and her parents noted with alarm that her piano playing greatly deteriorated. Indeed the poor girl soon found her restored vision rather a handicap. Actually seeing the keys of the piano bothered her, and interfered with the sureness of her touch which had been quite automatic when she was blind. Her parents saw her talent for music disappearing, and with it the profits made out of her virtuosity in sonata-loving Vienna.

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Intriguing friends whispered the Empress would be displeased and withdraw the pension she had conferred on the blind girl. Father and mother were persuaded to take the child away from Mesmer, but she refused to go. After a painful struggle between duty to her parents and her gratitude towards Mesmer, she gave in, returned home, but gradually relapsed into her blindness.

We can admire Mesmer's judgment in selecting such a wonderful example of psychological illness, and regret that fate gave him such a poor chance of continuing his treatment.

To-day, the case of *Fräulein von Paradis* would be called 'hysterical blindness', and modern research shows that in such psychological illnesses, mental and the physical states sometimes alternate like a see-saw. The mental strain caused by her need to readjust her whole mental life to her newly found power of seeing was too great when every influence around her, except Mesmer, was hostile to the change. So she gave up the struggle, retreated into her previous darkness, and no doubt her piano playing was correspondingly improved.

The effect of this tragedy on Mesmer was equally disastrous. He left Vienna and went to Paris where he was watched, consulted, accepted by the aristocracy, boycotted by fellow doctors, accused of licentious tendencies, and eventually the wheel of fortune turned once more against him. In 1784 the Parisian Academy of Medicine formally condemned his doctrines of Animal Magnetism. In so doing they expressed a very modern point of view on the subject, but without the slightest insight into what they were saying in the words 'Imagination does everything, Magnetism nothing'. We shall see the force of this later.

Finally, the French Revolution put an end to Mesmer's work by eliminating his patroness Marie Antoinette, and once more he was driven into exile. For thirty years his work, and even his name, lay buried. His therapeutic idea was virtually dead; then, suddenly, it revived, and the twenties of the new nineteenth century saw an explosion of Mesmerism all over Europe,

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which later spread to the United States. Mesmer had no part in this revival, and he died, a lonely old man, hardly interested whether his mental offspring survived or not, in 1815, the year John Keats qualified as a doctor at the Apothecaries' Hall.

Mesmer's great discovery then was the now fully accepted fact that there exists a mental force which can be directed from one person to another, and will cause an intense bodily crisis, followed by sleep, and often by a remission, or even permanent cure of certain symptoms. Mesmer insisted that this invisible force was 'animal' magnetism, a 'fluid', similar to electricity which 'flows' along a wire. His hand touching the patient, or touching water in which a patient would afterwards bathe, acted as the 'wire' or conducting medium for this 'Universal magnetic fluid'.

Even Luigi Galvani (1737-98) the Italian savant who is one of the fathers of the science of electricity, and who discovered that a tiny electrical current passed up the nerve of a frog will cause the muscle attached to that nerve to work, believed in 'Mesmerism'. In fact he considered that this impulse sent along the nerve and named 'animal electricity' was only a particular manifestation of the more general force called 'Universal magnetic energy'.

One of Mesmer's more aristocratic disciples, le Marquis de Puységur, carried the magnetic idea a stage further. When mesmerizing a farm-hand on his property he found that the fellow, instead of going through a crisis, fell into a condition of sleep-walking. He was asleep, yet awake. He could talk and hear, and obey orders. Most curious of all, while still in the sleep-walking stage he could receive a command, say to jump over a chair half an hour later, and this he would infallibly carry out when he came out of the somnambulistic state at the right time although he had no memory of what happened while he was asleep. Puységur also believed that a somnambulistic individual had special inward vision in which he could diagnose disease in others and even prophesy the future. This mode of 'suggested' sleep was afterwards to be called *Hypnotism*, but the

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word did not appear until 1843, as will be explained presently, and when it came, the idea was strenuously resisted by Elliotson.

Thus, when Mesmer died the principal features of his healing system were the idea of animal magnetism — a 'fluid' passing through physical objects, and the desirability of a bodily 'crisis', so that the cure could be produced by that fluid. In 1826 the French Academy of Medicine appointed another commission, this time a permanent one, to make a study of Animal Magnetism, and after some desultory experiments, mainly directed to the more fantastic sides of the subject, it issued a cautious report, not condemning Magnetism as the previous body of investigators had done in 1784, but pronouncing that further research should be encouraged. It was the kind of statement frequently released by a body of men who have not been able to think out the subject to the end, and finally agree on a compromise, hoping to conciliate both sides.

In all countries scientific men were investigating Animal Magnetism. The great British surgeon, John Hunter, among his experimental animals at Earl's Court, did not overlook the subject. Hunter studied everything that stimulated his scientific fancy. This shows that the interest of Mesmer's ideas was not confined to the specialist. Scientific men in the eighteenth century regarded magnetism as an innovation in the philosophy of human conduct, rather than principally a means of relieving pain.

John Hunter put magnetism to the test and came away convinced that it acted through the imagination, and that by fixing attention upon any part of the body, a sensation could be produced there. This entirely modern attitude was in advance of the time and John Hunter went back to his experiments in his private menagerie.

During the 1820s Mesmerism was practised all over Europe and was spreading to America.

One of Mesmer's pupils, a Frenchman who had magnetized patients at the Hôtel Dieu in Paris and called himself 'Baron' Dupotet, came to London in 1837, at the time of Queen

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Victoria's accession, and was permitted to treat patients at the Middlesex Hospital. He made no impression but was introduced to Dr. John Elliotson and was allowed by him to mesmerize patients at University College Hospital. This was the beginning of the new ferment in Elliotson's brain. He had been introduced to the subject some years before by an Irish mesmerist called Chenevix, but without any result, since at that time Elliotson 'remained unconvinced' as to the reality of mesmeric slumber. But Dupotet's experiments awakened his interest, and he began to feel it was his duty to investigate further, especially as Animal Magnetism had been used to produce anaesthesia for a surgical operation. Might this new method be a profoundly important agency in medicine, equal to or surpassing any drug that had ever been discovered? Might not the inward insight which the somnambulistic patient possessed become a fresh means of diagnosis? Elliotson was looking out for marvels. He was impatient with the medical resources of his day, and during the first year of Queen Victoria's reign he began his experiments in University College Hospital. They were successful: they convinced him, and he felt a mission to persuade others that Mesmerism was real, genuine, and likely to be of benefit to medicine. Now that Belief had entered his soul, this man of forty-six felt urged to communicate it to others. He knew the value of publicity and now he threw all his professional authority into an effort to present Animal Magnetism to the world.

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The medical lecture theatre at University College Hospital was crowded with an eager expectant company of two hundred, doctors, medical students and distinguished laymen, there by invitation, but naturally no ladies. There were the Duke of

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Roxburghe, the Marquess of Anglesea wearing light buff trousers, Sir Charles Paget who brought ivory opera glasses the better to see what promised to be an extraordinary performance. All the seats were filled and the spectators overflowed into chairs on the floor of the arena. Learned members of the Psychological Committee of the Royal Society were present, including Professors Wheatstone and Sylvester. There was a sense of awe and mysterious expectation when Dr. Elliotson limped into the room. He is not very tall, has a large head, straight nose, and gleaming dark eyes. After him comes a young girl about sixteen who is given a seat beside the lecturer, and as he explains the object of the meeting, everyone watches the girl's face.

This girl was Elizabeth Okey, or O'key, who with her sister Jane was a patient in Dr. Elliotson's ward, suffering from epilepsy and a number of other curious manifestations for the treatment of which she had been in hospital for over a year already. Elizabeth was immature, her face was the face of a child, and she was small for her age. Absolutely no interest could be seen on her features, and she paid no attention to the doctor's discourse and seemed quite unconscious that two hundred people were scrutinizing her with and without opera glasses, and waiting for some phenomenal or perhaps scandalous happening.

The lecturer declared his only object was to find and promulgate the truth. University College, he said, was a liberal institution, and their duty was to examine this new force of animal magnetism in the spirit of students of science and investigators of fact. He believed this new magnetic influence to be a powerful curative agent in disease, an opinion reached only after study and personal experiment.

As Elliotson finished his rather impressive address the spectators noticed that the girl's appearance had changed; her dull expression had become arch and lively, and she had passed into a trance. She began to speak with innocent familiarity in a pleasant voice, and she asked Sir Charles Paget sitting in the

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front why he was wearing his hat. Dr. Elliotson made a few passes, and the girl tottered and fell back in a sudden deep sleep and was caught as she fell to the ground. Then she woke, and walked around the arena, asking questions, sometimes nonsensical, often shrewd or witty. When a piece of wood was shown her she seemed to think it a living object, and to everyone's amusement said, 'Does your mother know you're out?' By making passes Dr. Elliotson made her go over into a state of catalepsy — in which her arms remained rigidly stuck out, and could not be moved. She could be put to sleep by commands, and wakened again by lightly blowing on her face. Two hundred pairs of eyes watch her, a tiny little creature in a flowing dress and a white collar edged with lace. Her hair is done up in a coil on the top of her head and in front of her ears, curls fall from her forehead, and long dangling ear-rings.

'Poor Dr. Ellisson,' she said at one point, 'would you like some sop with some milk in it?'

'No, for then I should be a milksop,' he replied amid general laughter, but the girl's attention was distracted. 'You've got some beauty oysters there,' she said pointing to the doctor's bright shirt buttons, 'but you've not got that rag on now, your shirt looks so clean and white.' The rag was Elliotson's black satin stock which she had noticed on a previous occasion. The bystanders who had come to watch a scientific exhibition became equally fascinated and bewildered as the lecturer explained everything that occurred according to his theory.

The sister, Jane Okey, was brought into the lecture theatre and proved to be even more susceptible to the mesmeric influence. His command to go to sleep was communicated from one girl to another as they joined hands. Once when the first sister was in her mesmeric sleep, Dr. Wood, Elliotson's assistant, asked her when she would waken, and she replied, 'in five minutes'. This was timed with the watch, and duly at the right moment, the girl passed out of her somnambulistic state, and resumed her shy and indifferent manner, saying only that her head ached. When the watchers shook hands with her as she

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left the theatre, she curtsied, and seemed much abashed and depressed. The first public session closed.

The distinguished spectators felt they had not come in vain. They walked down Gower Street debating the talents of these two girls, and looked forward to further marvels at the second exhibition a fortnight later.

One of the spectators, Sir William Molesworth, was so impressed by the affair that he forwarded a donation of thirty guineas to the hospital saying he was confident Dr. Elliotson's researches would 'add considerably to the knowledge of the phenomena of nature, extend the finds of science and afford explanations of numerous facts previously inexplicable'. That was a good definition of the scope of the inquiry, which was fated to outlast the life of anyone then present.

On the second occasion, the crowd was even larger and of equally famous people; some could find no seats. There were the Earl of Mansfield, the Bishop of Norwich who had to stand throughout, and Thomas Moore, the author of *Lalla Rookh*, was obliged to sit on a shelf at the back of the room and got his jacket covered with whitening from the walls. There were complaints because a larger theatre was not used for the performance. The fact of the performances was quite taken for granted, though the Hospital managers had registered silent disapproval. Few of the spectators appeared to think it strange that these procedures, which were really part of the patients' hospital treatment, were conducted in public. Charles Dickens, who loved this kind of excitement and was very aware of the suprasensual element in human personality, came over from Doughty Street where he was writing *Nicholas Nickleby* and attended one of the demonstrations, and what he knew, the whole world knew. Dickens had an understanding of abnormality, and on this day was born an interest which later had unfortunate consequences for his domestic happiness.

It was Dr. Elliotson's deliberate policy to give these mesmeric procedures wide publicity so that no one could deny the reality of what took place. He felt there was security in numbers and

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protection for his ideas against professional hostility; and by inviting well-known people to watch he judged it would be easier for him to prove his case and forestall incredulity. We have to remember that Elliotson belonged to the generation which had found that publicity can correct abuses. When he was a young man, the eighteenth century had lingered on, and medicine was surrounded with obscurantism. He had learned from Wakley, who was a pupil of William Cobbett. To find a parallel we should turn to America of the present day where secrecy is thought to be synonymous with tyranny.

In the next few years he was to find that for each friend he had made outside medicine he had raised up a host of enemies within, and these aristocratic spectators were to fail him. Nothing annoys the medical profession more than premature publication of a method that belongs properly to the orbit of medicine. Yet it is equally true that the development of new curative remedies is helped by public demand.

The second and third Mesmeric demonstrations at University College revealed similar mesmeric happenings with different patients: an epileptic boy who used to have a convulsion every day was cured after a month's mesmeric treatment and wished to go home. Girls with lockjaw began to talk. Elizabeth and Jane Okey came back and went through their repertoire. Their original complaint had been epileptic fits, but under mesmeric treatment they were shown to possess deeper personalities. Their antics became the central feature of each demonstration. There was always something new. *The Lancet* tells us, with judicious suppression of the name of the Deity, that Elizabeth Okey sang while in her delirium:

I went into a tailor's shop
To buy a suit of clothes,
But where the money came from,
G—— A——— knows.

A single pass from the doctor made her slide out of her excitement into another of her personalities, or perhaps a state of

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cataleptic stupor. Once when she had just come out of a trance Lord Mansfield, one of the spectators, put out his hand to her from behind, and immediately she fell asleep. Elizabeth chattered frequently about 'her negro', a kind of familiar spirit who told her to do various things, and the colour of whose skin no doubt symbolized something in her mind even more inexpressible and covered with shame. At another moment in the proceedings she said, 'I don't care for Mr. Stebbing, nor the devil either, my dear'. That was unfortunate, because Mr. Stebbing was chaplain to the hospital.

The demonstrations continued, sometimes in public, several times to a small group of medical observers, including a representative of Thomas Wakley who had now appointed himself investigator of Elliotson's ideas. Frequently *The Lancet* representative was left extremely puzzled by what he saw, but he gave an impartial and very full account, and each Saturday during June and July in 1838 the readers of that popular medical weekly could turn aside from Wakley's thunder over the Poor Law Acts, his denunciations of medical monopolists, and his sneers at Rhubarb Hall, to smack their lips over the pranks of the Okey sisters, and raise their eyebrows at the austere spirit of scientific inquiry in which Professor Elliotson approached their somnambulism and eccentric behaviour.

To a student of Mesmer's own works, and particularly one who had read the report of the French Medical Academy of 1826, there was nothing fresh in the performance of the Okey sisters. The same strange effects had been produced by Puységur, and the same 'Baron' Dupotet who had introduced Elliotson to the subject, and many others. Here in University College Hospital, Elliotson was repeating classical experiments well known on the continent and obtaining results which might be thought sensational, prophetic, or merely scandalous according to one's degree of insight. The strangest fact about mesmerism is that such happenings should occur at all. Manifestations so repugnant to common sense are repeated time after time, and always meet with the same incredulity. Elliotson was now

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finding what Mesmer found before him, and James Braid and James Esdaile afterwards, that the mere factual phenomena which have to be studied are so elusive and transitory that we can hardly fix them long enough before us to get a proper view.

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Professor Elliotson's experiments now took a new turn. It was found that the Okey girls could be put into a cataleptic trance merely by drinking water which had been magnetized by means of Elliotson dipping his finger into the cup.

In the next bed to one of the sisters there was an epileptic patient named Ross, and one day when Dr. Elliotson was in the ward, Ross had a fit. A chain of hands was formed between Elliotson and the patient, and after mesmeric passes, the fit came to an end, though previous convulsions of the kind had each lasted twenty minutes. Jane Okey was actually magnetized by making passes to her image in a looking glass.

A further and still more unaccountable phenomenon was the *apparent* power of the Okey sisters to prophesy the future. What seemed an unchallengeable experiment was made in the following way. An envelope sealed in five places was handed to the hospital matron on a Friday afternoon. On the following afternoon — Saturday — the observers visited Okey in the hospital ward, and found her in a cataleptic sleep, and she could not be awakened from it. Then, as the clock struck four, she sat up and looked around. The sealed letter was sent for, and the five seals broken. It was found that Okey had predicted that she would go to sleep on Friday afternoon, and that no one would be able to waken her for forty-eight hours. This prediction had been uncannily fulfilled.

Elliotson professed to have discovered two laws governing

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this mesmeric influence. The first was that magnetic power was stronger according to the mass of the object which originated it: thus, a greater mesmeric effect was produced on the medium with two fingers than with one, and a still greater result by using his whole hand. His second law was that *mucous* surfaces, such as the inside of the mouth, and covering of the eye, were capable of receiving a more powerful mesmeric stimulus than the outside skin; this explained why he could make the subject go into a deeper sleep by touching the tongue, or the eyeball, than merely by touching the forehead, and of course, the great power of the magnetized water when swallowed supported this notion even more strongly. All Elliotson's magnetic experiments show the working of a mind accustomed to the methods of physical science, and this was his undoing. Feelings and emotions are not to be measured like gases, fluids and solids. A different technique of mental research had to be found.

He had not neglected the curative virtues of animal magnetism. Epilepsy was a favourite subject for these methods. There was a curious interlude in which Elizabeth Okey was made to prophesy about the behaviour of other patients, and as these so-called prophecies really acted as mental suggestions they were generally carried out into action. In his medical lectures Elliotson frankly admitted with reference to the Okey sisters that young women were liable to imitative hysterical symptoms and were sometimes able to impose on the physician, but such possibilities did not shake his belief in mesmerism.

Nevertheless, he was unwise to lay so much emphasis on the extraordinary facility with which the Okey sisters responded to his experiments. To Elliotson, obsessed by the need to prove his theory through clear syllogisms in action which would convince his supporters and placate his opponents, these girls were a goldfield of potential discoveries. He might have gone years before meeting such a treasure trove of psychological riches. In his view it was more important to discover the laws of mental organization than to produce a few cures. But what other hospital doctors cared about was treatment, even though

MORE EXPERIMENTS

a few inquisitive noblemen might come to the *séance* to get sensation.

In the summer of 1838, even sympathetic observers were beginning to say that the Okey sisters possessed some natural aptitude for being mesmerized, and that their falling asleep, their different personalities, their foretellings, etc., were not due to any mesmeric influence from the doctor, but to a freak of their immature minds.

Modern psychiatry would agree. The dissociated or hysterical personality can accomplish all kinds of strange mental tricks. Forty years later the great Dr. Charcot, at the Salpêtrière Hospital, Paris, was to have his clientèle of suggestible women whose facility of being psychologically moulded by him was like the plasticity of soft clay to the thumb of the potter. But the fact of this hysterical temperament was unknown to John Elliotson: he pursued his experiments, and where others saw only a sequence of meaningless occurrences from a pair of female charlatans, he saw the promise of mental laws. To everything he gave a purely physiological explanation. Those who watched saw only an exhibition, which after the novelty had gone became rather disgusting, and the spectators might be pardoned for regarding Dr. Elliotson as the only man in the room to be taken in by a pair of designing females who had trained themselves to show off.

In the background Sharpey, University Professor of Physiology, was working against him. His letter to Elliotson is a masterpiece of the sort of reasoning which timorous men use to shirk a public issue. He admits that mesmerism is entitled to a fair examination, but objects to Elliotson's exhibitions because 'in the present state of opinion the frequent repetition in the hospital appeared not altogether judicious'. Yet Sharpey had not been present at any of Elliotson's demonstrations.

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THE OPPOSITION

In June, Elliotson was warned by the Hospital Committee that he must give up these public exhibitions. He replied haughtily that no consideration would prevent his going on with his investigations, but although he had only admitted to his demonstrations scientific men and other reputable people who clamoured to attend, he would not discontinue public *séances* and would send the Committee a list of the names of people who asked to be allowed to come. He sent names, but apparently the Committee did not bother to read them. Meanwhile, he went on with his mesmeric treatment in the hospital wards. The Medical Committee of the hospital at first treated him gently, and passed a resolution 'fully recognizing Dr. Elliotson's undoubted right to employ animal magnetism as a remedial agent in wards of the hospital when he considers it necessary to do so'. But privately they advised him to desist.

From the beginning it would have been better for him to have carried on his tests with the Okeys *in camera* or before doctors at the hospital, and laid more emphasis on his undoubted success in abolishing pain. Thomas Wakley, swollen with self-confidence, hardened by successful lawsuits, and bursting to expose abuses, was on his track. Each week *The Lancet* devoted columns to reporting the sensational events at the 'North London Hospital'. So far these accounts had been written in a neutral, admirably impartial style.

In the first *Lancet* report the question arose as to whether the Okey sisters were merely impostors with a peculiar gift for feigning sleep and 'temporary insanity'. The tests now took on a medico-legal flavour, and the supposedly detached observers from *The Lancet* tended to become detectives prepared to spy out inconsistencies and build them up into a grand hypothesis of fraud. Some of Elliotson's less important patients were detected in what seemed calculated deception.

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It was not realized that genuine hysteria, a psychological make-up in its own right, is both the notorious mimic of all other diseases, and also exceedingly contagious. Actual epidemics of hysteria are not uncommon. With such star performers in a hospital ward as the Okey sisters it was natural that other patients should unconsciously imitate them.

The experiments now took a new turn. Jane Okey was taken into a ward full of patients suffering from rheumatism, paralysis, consumption, chorea and other diseases. She was asked by Elliotson to place a gold sovereign in the hand of each patient by turns. When the patient was not too ill, the sovereign had the effect of driving him into an instant stupor, as though the magnetic force had been imparted by Jane to the metal coin and passed on. Further tests seemed to prove that such magnetic power in the coins weakened in its effect after several trials.

Eight golden sovereigns were laid edge to edge on a table. The doctor put his finger on the first coin, and Jane Okey touched the eighth, then the seventh, the sixth, and so on. It was found that the mesmeric impulse emanating from him acted more powerfully on her the nearer she came to sovereign number one. Shillings used as transmitting agents in the same way were much less satisfactory, in fact, no stupor was obtained until the medium touched shilling number two. Still further tests, this time in the presence of the French Ambassador, were made upon the transmission of the supposed magnetic 'fluid' along a gold chain with the Okey girl holding one end. It was found that gold and silver were better 'magnetic' conductors than copper, platinum or iron. These experiments with magnetized glasses of water, sovereigns, gold chains (Elliotson touching and commanding) were carried on during the summer of 1838 in various permutations, and the cumulative effect on the observers was to increase their mystification without adding much to their sense of certainty. But Elliotson had yet many approving friends.

The Lancet, still cautious and well disposed, spoke a warning

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against the danger of condemning the whole thing as an imposture because of occasional failures, and it complimented the observers on their courage and manliness in really tackling the subject of mesmerism, which had not been properly investigated except by inefficient pretenders.

But shrewd observers were pointing out that the Okey performances could be explained by the minute changes in temperature caused in the sovereign when it was handled by the operator, and the slight warmth imparted to the water in the glass when Dr. Elliotson inserted his fingers to magnetize it. It was said that Okey's senses were able to detect these infinitely small variations of heat and cold which would pass unnoticed by the ordinary person. Here again a true observation upon hysterical phenomena had been stumbled upon, but its meaning entirely missed. Under hypnotic sleep it is a fact that the senses may be rendered very acute. Hypnotized subjects, for instance, can read the picture on a playing card by passing the finger lightly over the surface in the way a blind person reads Braille. It is not at all surprising that the Okey sisters should have possessed this faculty. They revealed other familiar hysterical phenomena such as phases of complete dissociation of personality. One sister actually embroidered a needlework sampler while in one of these dissociated states and was quite unaware of it on resuming her normal personality.

It was a sufficiently remarkable thing for a girl to have the power to detect minute changes of temperature beyond the range of normal senses. Yet this was attributed to a cunning imposture. In 1838 the real mystery of the hysterical temperament was unsuspected either by the medical observers or their journalistic critics.

A Dr. Herbert Mayo, surgeon to the Middlesex Hospital, came near what we now believe the truth lying behind these remarkable cases when he referred to 'workings of a spiritual nature in a certain independence of those bodily organs to which it is normally closely tied and bound'. But this hypothesis was received by Wakley with mocking laughter. If for

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the word *spiritual* we read *psychological*, the description gives a good picture of how, in hysteria, the unconscious forces of the personality tend to acquire an independent domination over the bodily organs. But all such notions were still half a century distant.

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I would give much for the retrospective privilege of being present on an evening in August, 1838, at Thomas Wakley's house at number 35 Bedford Square, Bloomsbury, when the astute Editor gave Dr. Elliotson a final opportunity to prove his case. The date is a fateful one in the history of psychopathology. If the Professor of Medicine can satisfy this keen judge of medical affairs that his study of mesmeric phenomena is scientific and founded on factual evidence, all will be well. Wakley will continue to support him heartily. A cause mentioned favourably in the columns of *The Lancet* is sure to receive attention. Dr. Elliotson will develop his speciality, will teach it to his students, and a new branch of healing will be set up in London. If they sing in unison, Wakley and Elliotson will be irresistible. Should it be found that their minds are set in different keys, and should he detect impure notes, Wakley's indignation will transfer John Elliotson to the ranks of those false performers whom he feels it his duty to ridicule and destroy.

Wakley was then forty-three years old and had been three years in the House of Commons. Fair hair blows over the shoulders of his burly frame behind the florid square face with a straight powerful nose and small blue eyes, and on the staircase of the large, richly-furnished house he welcomes Elliotson in a confident manner, for he has set the stage for the final

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experiment, and he is certain that if any imposture occurs, he will find it out. At to-night's *séance* there are present ten people, five representing each side of the controversy. It happens that Elliotson has chosen as one of his own nominees a Mr. Clark, one of *The Lancet* expert reporters, whom he trusted as an impartial witness. There was also the 'Baron' Dupotet who first introduced Elliotson to mesmerism.

Elizabeth Okey is to be the subject of the test which follows generally the lines used in the hospital demonstrations. This occasion is only the culmination of a series of private tests made in Wakley's house. Already Wakley has disposed of the matter and mentally rejected the evidence, but Elliotson has persisted in asking for a further opportunity. Wakley has agreed, thinking privately that now it was not mesmerism which was on trial, but the opinions and even the good faith of the doctor.

We must censure John Elliotson for dragging in Elizabeth Okey all over again, and making her behaviour the matter at issue. Her character, the genuineness of her reactions have become the theme of the inquiry, rather than the truth of mesmerism. Elliotson had allowed himself and his science to be identified with an unstable girl, and it will stand or fall by the impression she made on the hawk-like Wakley who is interested less in mesmerism than in medical ethics. Wakley was medically qualified, and it would have been professionally correct as well as polite to demonstrate to him actual cases where mesmerism had produced a remission of symptoms. Elliotson could easily have brought some of them for a quiet discussion. In place of such a prudent course, which might have produced conviction, or suspended disbelief, and would have vindicated more thoroughly his own reputation as a scientific physician, Elliotson brings forward Elizabeth Okey, and persists in demonstrating through her his theory of the mesmeric fluid supposed to attach to a piece of metal. To prove his thesis that gold and nickel were more sensitive to mesmeric influence than baser metals, he had provided discs of nickel and discs of lead. Elliotson was seeking a scientific truth, Wakley

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a professional abuse. And each welcomed the publicity he believed to be on his side.

We may imagine the young girl, well accustomed by now to being a centre of scientific curiosity, yet nervous at the new surroundings; she sits in a chair facing Wakley, and a cardboard screen is held between them. She knows what will be expected of her, she cannot help knowing.

It is decided to carry into practice the theory that when she touches the magnetized nickel disc she will suffer a hysterical convulsion and perhaps go into a trance. But when the lead disc, also magnetized, is given her, no such effect will follow; for, according to Elliotson's hypothesis, there is an aristocracy among the metals. Nickel is mesmerically more honourable than lead. In this crucial pseudo-experiment the whole question is narrowed down. It has become a trial of truth or error, like the medieval method of testing veracity by making the suspected person walk on red-hot ploughshares. It was considered by both sides to be scientific, but it was really a test of faith, and I repeat, it was the test as proposed by John Elliotson himself in perfect confidence and self-belief.

Several experiments with the nickel and the lead were now gone through, but without any conclusive result, and Wakley, growing impatient, decides to cut the Gordian knot by a little trick of his own.

Wakley takes the nickel disc, suitably magnetized by Elliotson, and, by a prearranged plan, passes it not to Elizabeth Okey but to Clark, and unseen by Elliotson. Clark walks to the far end of the room. At this moment, Wakley gives the *lead* disc to Elizabeth Okey, while someone, also by prearrangement, says aloud: 'Take care you don't apply the *nickel* too strongly.' At once the girl falls into a convulsion.

John Elliotson comes forward and smiles, remarking that his case has been proved, since the girl's convulsion shows clearly the power of the mesmerized nickel.

But Thomas Wakley's mouth is firm, his nostrils curve scornfully, and his whole bearing shows finality as he informs Dr.

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Elliotson that in fact for this test no nickel was used, but only a disc of lead which, according to the theory, should have no effect. Clark comes forward from the other end of the room and confirms that the nickel disc was in his pocket all the time. The piece of magnetized lead, which, according to the doctor, should have caused no reaction whatever, had thrown the girl into a convulsion.

No one seems to have perceived the obvious fact that it was not lead or nickel that mattered, but the belief aroused in Elizabeth Okey's imagination, or, as we should now say, the *Suggestion* presented to her. As the French Academy had declared with such unwitting precision in 1826, 'Imagination does everything: magnetism nothing'.

Wakley is proud of the little stratagem which constituted his part in this scientific experiment, but Dr. Elliotson is upset, and they go through the whole performance all over again, several times. Pitifully Elliotson clings to his theory of magnetic fluid, and explains that the effect of the nickel must have lingered and overlapped the application of the lead, but such a possibility is laughed away by Wakley.

At this point the doctor was called away, and he took with him the pieces of nickel and lead. Wakley decided to carry on the experiments himself, and he sent out to an instrument-maker and fetched a piece of nickel and also a lead musket ball beaten flat. Then began a further five hours of renewed experimentation in which all the familiar tests were used on both Jane and Elizabeth Okey, and need it be said, with entirely negative results. Although both girls frequently went into mesmeric convulsions there was no constant connection between their onset and either nickel, lead, magnetized or unmagnetized water. It is not surprising that Elizabeth, having been under this close observation at Wakley's house from 9 a.m. until 10 p.m., felt rather sick.

But the gentlemen were satisfied, feeling convinced that this parlous *séance* had been a genuine scientific examination, and that 'animal magnetism constituted one of the completest

delusions that the human mind ever entertained'. At nine o'clock next morning the *séance* is renewed, Elliotson still insisting that the nickel test be repeated. The same equivocal results are obtained; that is, when the girl *thinks* she is being touched by nickel, though in fact lead is being used, she has the convulsion. Elliotson will not give up his idea of mesmeric fluid, nor Wakley his theory of fraud. The *séance* is over, but no clearer picture of truth emerges from the troubled soul of Elizabeth, who is only a poor hysterical girl, and the most susceptible person in the world to currents of feeling passing around her. In this ordeal two well-endowed men have lost all perception of the subtle reality of what they are investigating.

The true method of psychological research had not been born, and these men were treating the delicate temperament of Elizabeth Okey like a monstrosity at a country fair. Elliotson was hampered by his predetermined theory of a mesmeric fluid, something that could be weighed and measured as Boyle weighed the air, while the forensic Wakley could see nothing but an abuse to be corrected and a cause to be pushed. Between them, they acted with shocking irresponsibility, but the low standard of mental science in their own day must be their excuse.

Psychiatric research demands its own methods, in which figures and logical reasoning do not count as much as they do in chemistry. Subtle understanding of mental impressions, the use of intuition, the impalpable essences of personal temperament were foreign to these investigators.

From a psychological point of view, this grand occasion proved nothing, but it was the ruin of John Elliotson. He was beaten not by greater truth, but by superior tactics.

He was unwise ever to have consented to such a ridiculous trial. But I do not believe he was duped by Elizabeth Okey in the sense that she was a conscious charlatan deliberately deceiving him. On more than one occasion he expressed awareness of the hazards of meddling with an adolescent mind.

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But the child was too anxious to please him. His theory of mesmeric fluid was a mistaken part of his extraordinary revelations. He was conducting the inquiry with the sort of safeguards he would have used in examining opium or quinine and attempting exact measurements of psychological material, a process like trying to generalize about the ebb and flow of the tides from the examination of a cup of sea-water.

As for Thomas Wakley, his motives were simple. He had succeeded in his aim of fixing the stigma of discredit upon the whole business.

The public aspect of the inquiry was now developing. A 'Magnetic Committee' was formed to investigate animal magnetism. Although its membership included Professor Wheatstone, the Physicist, and Dr. Herbert Mayo, Professor of Anatomy at the Middlesex Hospital, Wakley announced significantly in *The Lancet* that whatever the Committee should decide, *he* would publish his own independent report and conclusions.

10

WAKLEY GIVES JUDGMENT

Thomas Wakley was no longer a rising radical journalist who pirated medical lectures and denounced the BATS of Lincoln's Inn Fields. He had become a power, a national figure. His first great speech in the House of Commons had much to do with the release of the Dorsetshire Labourers condemned to transportation for forming a Trades Union; he pleaded for the appointment of medical coroners, denounced flogging in the army and was in favour of opening the National Gallery on Sunday. In Queen Victoria's first Parliament he represented Finsbury, being returned at the head of the poll, and he made rousing speeches on every occasion. Although by temperament a perpetual self-appointed prosecutor of some

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personal institution, he held that there were no men in society so destitute of common sense as lawyers. In 1838, Wakley was a force, dangerous to have opposed to one, for all his bluff good humour. John Elliotson, once admired and helped by him, was now to feel the violence of the Wakley war of lightning.

This great umpire of medical controversy decided the time had come for a summing up, and in two editorial articles in September 1838, he polished off mesmerism in his brilliant cocksure style.

Wakley had always given his columns and encouragement to John Elliotson. For ten years his clinical lectures published in *The Lancet* had brought him fame. In the mesmeric investigations at University College, Wakley had been an impartial observer, and no one can say he had been prejudiced in the accounts he gave of the Okey phenomena. But the episode in his own drawing-room decided him. He made up his mind that the Okeys were cunning charlatans, and once Wakley had discerned an error on the medical horizon, he grasped his weapon the pen, and used it without any inhibitions.

‘Careful investigation and a consideration of all the experiments have convinced us that the phenomena are not real, and that animal magnetism is a delusion; we shall, therefore, lose no opportunity of extirpating an error which in its nature, application and consequences is pernicious.’ So thundered Thomas Wakley, M.P. for Finsbury, Coroner for West Middlesex, proprietor and editor of *The Lancet*.

He continued in a lower key, that the existence of somnambulism, catalepsy and delirium is admitted on all hands, that it is an elementary truth that one human being can affect another. But all such influences, both voluntary and involuntary, take place through the senses.

Here was a very large admission. Wakley was highly proficient in the technique of controversy, and knew how to gain dialectical advantage by admitting what he could not disprove. He agrees that the mesmeric phenomena possessed a real existence, but to him they are so obvious that no examina-

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tion was necessary. In these few sentences he betrays the finality of his closed mind which was the very opposite of Elliotson's more genuine attitude of research. Of course, Wakley puts his finger upon the obvious difficulty which Elliotson had manufactured for himself, the question whether the magnetic power, or fluid, whatever it was, could adhere to a gold sovereign or persist in the glass of water without the subject being consciously aware that the coin or the water had been magnetized. 'Okey lays her hand on a sovereign and is prostrated', says Wakley. 'We lay our hands on the same sovereign and perceive no such influences . . . Gold is exchanged in the mesmeric state (necessarily) in every part of England, and has been so exchanged for centuries . . . but no individual has ever been thrown into a catalepsy by it.' It was very ingenious debating, but the editor here overstates his argument. No one had suggested that the magnetic influence lasted very long. In fact, its range was admittedly short, as Elliotson had shown, and its effects very personal and limited, as it is very easy to understand to-day, within the orbit of suggestion.

But Wakley's mind was made up, and the *séance* in Bedford Square had firmly convinced him that Elizabeth Okey was a clever impostor — 'a genius in her own line', who could mimic anything, epilepsy or any other symptom known to medicine, who could pretend somnambulism, flatter Dr. Elliotson and perform whatever marvels were expected of her. Wakley rubbed his hands, continuing, in his playful tigerish way, by stating that a splendid mesmeric farce could be written around Elizabeth as the principal actress and one of the minor theatres would find it no bad speculation. As for her power to endure painful stimuli without appearing to notice anything, Wakley airily dismissed it as a not uncommon phenomenon. He was not impressed by the coin-passing tests and said that the ingenious tragedienne Miss Okey guessed things by concentrating her quick eyes on the mesmerist's behaviour, and that it was easy for her to detect small changes of heat and cold!

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As for those who said that the Okey girls could have no motive for practising such a tissue of deception, Wakley roared, 'No motive? We see such motives as few uneducated girls could resist. Okey, no doubt, in the first place, pitied the believers panting for signs and wonders which the slightest exertion of her will could produce, she desired to please and astonish her dear good friends: and what ambitious spirit could avoid entering a field where all her faculties could exert their utmost power over a large audience? To all these fascinating allurements there was nothing opposed but an ill-educated and perhaps half-deceived conscience.'

This is right and also very wrong. Wakley had touched off the logic of the situation like the prosecuting counsel he was. English common law presumes that a person intends the consequences of his own actions, and Wakley carried this presumption into the realm of psychology where it does not belong. If the Okeys did these things, well, they must be presumed to know what they were doing, and if the tests turned out wrongly, therefore the motive must be fraudulent.

Wakley failed to perceive that the Okey performances sometimes, trivial though they might be, offered a glimpse of the underworld in human nature. In this controversy his behaviour resembles that of the early American prospectors for iron ore around Lake Superior. They were looking for a mountain or some great obvious mass of metal and failed to find it. Later searchers found that the iron ore was indeed present in that same region and in surpassing abundance. But it lay beneath the grass below their feet, not in a great mass of rock, but in a fine powder under a thin layer of soil. If one of the early pioneers had gone mad and stuck his heel in the ground, he would have uncovered the ore. But they were blind because they looked upward, into the sky, seeking a great mountain.

Wakley and his contemporaries failed to see that an immense psychological truth was lying near them, but it was finely divided in a succession of pathetic, laughable and trivial acts of two hysterical girls. It needs a touch of madness to penetrate

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the reality of unconscious mental processes, and there was no divine madness in Wakley's composition. The world is frequently lulled into false security by the Wakleys of this life, who make such a noise and give so many proofs of their zeal for progress.

Even supposing Okey's motives were exhibitionist and vain-glorious (and the hysteric is both), the extraordinary mimetic success with which she could carry them into effect revealed possibilities, depths, and unknown currents which should be explored by Science, and which offered very different conclusions on psychology from the legal assumptions made by Thomas Wakley, who considered the whole issue settled when in a loud voice he had pronounced the verdict '*Fraud*'. The great editor was duped by his own reasoning. Supposing Elizabeth Okey could detect the mesmerized water *only through her senses*, was this not a sufficiently remarkable extension of normal sense activity to be worthy of investigation?

We may ask such questions from the secure position of a century of psychological knowledge not available to Wakley. Even granting what he thought so obvious, namely that the Okeys were fraudulent, it now seems to us a significant opening for medical research, for we have learned that even crime, accident-proneness and trivial delinquency are branches of psychiatry which should come under the physician. Fifty years later, Freud was to write a whole book dealing with the psychopathology of mistakes.

Of course, the Okeys were natural histrionics. The hysterical temperament, with its extremes of suggestive power, its capacity to change roles and actually live an imagined character, makes the best actors and actresses. The 'Negro', and the fantastic figure of 'old Jackey' whom Elizabeth Okey saw on the patient's bed, made interesting evidence of the schizophrenic personality very well known to modern psychiatry, but to our materialistic forebears they had no significance except as proof of trickery. Wakley was more correct than he knew when he advised sarcastically that the Okeys should go on the stage.

DISGRACE

Poor Elizabeth and Jane — if only their talent had been slightly different! If, for instance, they had been brought up in a theatrical family, these girls might have won fame, instead of narrow notoriety as nervous wrecks in a hospital ward.

The manner of Wakley's so-called investigation of the phenomena of animal magnetism followed the same lines as the two commissions of the French Academy of Medicine. What he did not understand, he pronounced as non-existent. But it has to be admitted that John Elliotson himself went more than half-way as the causal agent of this misunderstanding.

II

DISGRACE

Meanwhile at University College Hospital opposition to mesmerism gathered and Richard Quain the surgeon was sent privately to Elliotson, to ask him to give up his experiments — 'for the good of the hospital' — pointing out that such notoriety was bad for a school which was in competition for pupils. It was an ill-advised approach to make to a man like Elliotson, and he retorted icily that 'the institution was established for the dissemination and discovery of truth' and that the professors should lead the public, and not the other way round. Debates went on among the Hospital Council and the professors, among whom Elliotson's professional success was too great not to have aroused jealousy. When asked not to continue the mesmeric exhibitions in the hospital, he inquired where they should be held. To which the ill-considered reply was made that he should carry them on in a public-house. Feeling on very sure ground here, Elliotson announced his refusal to demonstrate sick patients anywhere but in the hospital. Sharpey, the Professor of Physiology, admitted there might be something in animal magnetism, but declined to associate himself with pro-

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ceedings which seemed to him injudicious. That erratic genius Lord Brougham, an ex-Lord Chancellor, was on the Hospital Council. Of him it had been said: 'What a pity he did not know some Law, because then he would have known something of everything.' We may be sure Brougham knew about mesmerism, but even such a forensic talent was not powerful enough to aid the Professor of Medicine against his enemies.

One final disastrous development of Elliotson's doctrine arose out of Elizabeth Okey's apparent power to predict the future. He seems to have thought this faculty could be used to improve the art of prognosis, that is, the estimate of what course an illness will take.

To perform this act of clairvoyance Elizabeth Okey was taken into the men's ward, 'in the twilight', as the horrified hospital managers were informed, and there asked to write down how each case would progress.

Elliotson defended himself by saying that he had not taken this unusual course without asking the nurse in charge of the ward, 'whether the step might be taken with propriety', that is, the step of taking a girl into the male ward 'in the twilight'. We note here an echo of the scandals which always gather around mental treatment, equally in Mesmer's day, Elliotson's, or our own.

Predicting the future, and especially the supposed power to diagnose the illnesses of other patients, had been a special feature of the Marquis de Puységur's experiments. Certain people, in a state of somnambulism, are able to answer questions put to them by the operator. Asked to touch a patient, and to name the locus of his disease, these sleepwalkers would point to the part affected. Such experiments were a source of confusion and had discredited orthodox mesmerism, especially when they took place on theatre stages, or were used for trivial objects such as to discover lost jewellery. Yet to John Elliotson, always searching for something fresh, clairvoyant diagnosis seemed no more impossible than X-rays at the present time.

Moreover to-day it is well established that some persons do

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possess this power of telepathy — of divining what is in the unconscious mind of another. It does not even require somnambulism to bring out such super-awareness, both at the level of parlour tricks and in more significant forms. But in 1838 Elliotson's interest in such possibilities stamped him as a charlatan.

The evidence of the twilight ward was completely damning. A nurse testified that when placed in this compromising position and asked to make her clinical predictions about one patient, Elizabeth Okey shuddered and said that 'Great Jackey' was on the bed. When asked who that personage might be, she had answered 'the angel of death'. We are not surprised to hear that 'this threw the ward into a complete flurry'.

Elliotson gave serious attention to this misconceived experiment so irresponsibly conducted. He believed that a patient about to die gave off an emanation impossible to detect by ordinary scientific means, yet observable by a supersensitive person such as Okey. But for all his sincerely-held beliefs, this last test proved the final calamity.

He was immediately asked by the Governors to discharge Okey from his ward, and when requested to practise mesmerism no more among his patients, he promptly sent in his resignation.

Three days after Christmas in that eventful year, Dr. Elliotson held a dinner party at his house in Conduit Street and entertained a number of students favourable to his cause, and put before them an earnest statement of his case. But even in his defence he was maladroit. At the beginning of the college term he invited one of his supporters to breakfast and handed him a document of thirty-six pages which he asked should be read to the assembled students. The embarrassed young man read it through during the professor's breakfast and found that it was full of diatribes against the University faculty. What medical student could take the responsibility for discharging such a dangerous mission? After breakfast, the young man declined to be the mouthpiece of his teacher's indignation

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In the anatomical theatre of University College Hospital, Dr. Sharpey's lecture on physiology is just over, and 300 students gather, prepared to spend their lunch hour discussing the right and wrong of what has been done to their professor of medicine. Many of them are convinced he is a martyr, others think him a charlatan, and some have only come to see the fun. The Elliotson party have announced openly that they mean to compel the Hospital Council to invite the professor back. For, unlike the medical schools of to-day, the teaching hospitals in 1838 had great difficulty in keeping open, so severe was competition, with the result that what students thought of their teachers was vital. Medical undergraduates, then as now, were loyal to their professor, and outspoken in expressing their opinion of him.

A certain Mr. Mackenzie is forced into the chair and the meeting opens in a lively style. Impassioned orators explain that Dr. Elliotson had increased the number of students from 90 to 200, and his lectures contained everything that the present state of knowledge could supply. A somewhat ambiguous resolution was moved, expressing appreciation of the professor, and regretting the circumstances which had *necessarily* led to his resignation. Mesmerism kept breaking in, but was firmly stamped upon by the chairman. A fervid admirer read extracts from Elliotson's textbook of physiology (amid cries of 'we know all that') and moved that the students do 'most earnestly and strenuously though respectfully' ask for his return to them.

Another speaker said the reputation of the hospital had been damaged by mesmerism, but he was shouted down. There is a most persuasive Mr. George who successfully leads the sympathy of the meeting away from the professor and towards the governors; he remarks that eminent though Dr. Elliotson is,

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they would be better off with a man his inferior but more respectable. (More cheers and confusion.) Dr. Elliotson's assistant rose to defend him on points of detail. As the vote drew near, the meeting became a babel and quite beyond the chairman's control. Finally, with three motions before the meeting all at once, the students, by one of those unexpected twists that a public gathering takes, came back to the original motion which was promptly carried. This was the proposal 'regretting the circumstances which had necessarily led to Dr. Elliotson's resignation', and was, of course, a substantial victory for the opposition. Whereupon someone demanded a further vote by ballot before one o'clock on the following Saturday, this hour being fixed because the hospital governors were to meet at four o'clock on the same day.

It was a lively day for the students. The professor's party 'beset every avenue leading to the theatre like canvassers at the old elections', and the ballot was cast. Again the original motion, which was rather favourable to Elliotson, though not entirely so, was carried by a small majority, and was sent up hurriedly to the Council. Unfortunately, the Council of University College Hospital had just resolved to accept the professor's resignation.

Dr. John Elliotson was now officially discredited, having been obliged to yield up his university chair and his hospital wards. As Wakley put it, 'when he became a mesmerist, he ceased to be a physician'. His two professional foes at the hospital, Liston and Sharpey, are well known, but Elliotson, with at least as much work to his credit as either of them, is remembered only for his downfall. But he was not to be extinguished, and his private consulting practice was as great as ever. He did not force mesmeric treatment upon any patients, unless they wished it, and his old laborious skill in diagnosis and his adroitness in using drugs remained.

At this nadir of his professional life, John Elliotson followed the spirit of Virgil's line: *Flectere si nequeo superos, acharontia movebo*. He had failed to bend the gods to his will: his own

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colleagues had cast him out. But there remained still the lower regions, those large audiences who were fascinated with mesmerism, those innumerable hosts of patients willing to try any remedy for their pain, even though it be frowned upon by the medical staff of University College Hospital. It would not be true to say that he acted henceforth unprofessionally. But certainly he isolated himself, addressed his teaching not to a small group of doctors, but to the whole world. To carry out his methods of treatment, he opened a 'Mesmeric Hospital' at Fitzroy Square, London.

There was an explosion of interest in mesmeric ideas about this time, and similar hospitals were started in Edinburgh and Dublin. Warfare between the leaders of the profession and the upholders of Elliotson's ideas went on in the medical journals, and so shrewd a judge of scientific evidence as the Prince Consort was heard to say that 'medical men were conducting themselves in a very improper manner by refusing to investigate the facts presented to them by the science of Mesmerism'.

Among those fascinated by mesmerism was Charles Dickens, who had been an interested spectator of Elliotson's first public demonstration in the lecture theatre of University College, and later had formed a close friendship with the doctor with whom he dined frequently. The subject could not have found a more fertile receptor than the bizarre imagination of the great novelist, and Dickens practised mesmerism frequently, became very self-confident and proficient, and he was always ready to put one of his friends to sleep. In Forster's *Life of Dickens* we do not find many references to these mesmeric exercises, but Dame Una Pope Hennesey in her recent biography describes the dramatic and embarrassing consequence of this curious hobby. While staying in Genoa with his wife, Dickens began to take a marked interest in the spouse of a Swiss banker who was living near. The lady was in an unhappy state of mind and suffered from delusions that she was haunted by evil spirits. Dickens set to work to cure her by mesmerism, while Mrs. Dickens saw with growing anxiety the visits twice a day that

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were required in order to dismiss the wretched lady's phantasms, and the intimate conversations that Charles considered necessary in order thoroughly to grapple with his patient's secret thoughts. Later, when the Dickens family moved to Rome, they found the Swiss banker and his wife installed there already, and the mesmeric treatment was resumed. The patient's supernatural visitation was at its worst round about one o'clock in the morning, and on one occasion at this hour Mr. and Mrs. Dickens were wakened by the banker who knocked at the bedroom door begging that urgent relief be given his wife who was rolled up on her bed in a ball. Charles Dickens was equal to the occasion, and after a few strokings and commands the lady was persuaded to relax and go to sleep.

Mrs. Dickens was distracted. Her literal mind did not pretend to plumb the mysteries of mesmerism and she could not see the difference between the need for such treatment felt by both mesmerist and patient, and falling in love, and she cold-shouldered the banker's lady. Only after nine years did her husband induce her to be reconciled to the woman of whom she had been so reasonably jealous, but this incident did not increase domestic felicity in the Dickens' household. This grotesque episode in the life of a man of prodigious imaginative faculty shows some of the dangerous consequences of Elliotson's impatience to give publicity to a method that ought to have been kept in skilled hands.

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Remembering that his early reputation as a physician had been built up on articles in *The Lancet*, Elliotson now resolved to call in the aid of journalism once more. He started a new organ of publicity. He intended that his new journal, *The Zoist*, should

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be as unlike any medical publication as possible. Certainly he succeeded in making it a curious mixture of science and propaganda, of the most excellent sense and fantastic nonsense. Of course, its principal theme is the promotion of mesmerism, but there is another theme which comes in every number, and reminds us that Elliotson's early intellectual life had been passed under the influence of that wandering philosopher Franz Gall who had invented Phrenology, a complex system of facts, conjectures, anatomical guesses and incomprehensible doctrines which is now neglected, perhaps undeservedly.

Elliotson was fascinated by criminology and *The Zoist* is full of reports of cases, drawings of murderers' skulls, and very modern speculations on insanity as a defence for murder. Cerebral physiologists have an answer to everything, whether it be the bumps on the head of Constable the landscape-painter, or national education for the working classes.

But mesmerism takes up even more space in the journal. A young woman in Leicestershire has an amputation of the thigh under mesmerism, and feels no pain; it was a remarkable instance observed by several qualified persons. The magnetizer himself notes that before the operation the patient's pulse was 94, whereas his own ran up to 120. Other equally sensational cases fill the pages: deafness cured, cancer removed, epilepsy, paralysis — the open mind must be convinced, and Elliotson bitterly quotes an aphorism of the philosopher Dugald Stewart: 'Unlimited scepticism is as much the child of imbecility as implicit credulity.' 'I have given details of seventy-six painless operations,' says Elliotson, 'in the name of common sense and humanity what more is wanted?'

The case of Miss Harriet Martineau, the well-known authoress, was duly reported. She was taken ill while on a visit to America in 1844, and gradually over the next few years became a chronic invalid, quite unable to enjoy life. Actually she suffered from malplacement of the womb with symptoms familiar to every gynaecologist, and there seems to have been a strong neurotic element in her case. Eventually she became

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confined to bed and could only get sleep under a basketwork arrangement keeping off the pressure of bedclothes. The word 'incurable' was beginning to be implied if not used by the many doctors she consulted. As a last resort, mesmerism was begun by a surgeon, and carried on by Miss Martineau's maid! In five months the patient wrote to Dr. Elliotson: 'I am quite well, feeling no traces of my long disease. I never have the slightest or most transient pain, and my strength seems inexhaustible.' She remained well, a convinced believer in mesmerism as 'a fact in natural philosophy'. A lively correspondence followed when people denounced Miss Martineau's maid as 'an impostor', who should be dismissed, but the authoress had the last word, declaring she would continue to keep both the mesmerism and her maid as well.

We may read through volumes of this extravagant publication, *The Zoist*, and the mystery deepens. Were Elliotson and his followers only deceiving themselves? Are these mesmeric displays to be compared to the Indian rope trick, which has always resisted scientific examination?

The evidence piles up, the cases increase, the number of successful instances of mesmeric operations and mesmeric cures seems destined to go on without end. Yet the truth of the matter recedes.

The belief needed for such mesmeric cures is as elusive as a sunbeam. We try to grasp the reality, but it slips out of our hands. Mesmerism seems to need a peculiar conformation of time, place and person before it can be effective, and the climate in which it will best flourish is not the bleakness of disbelief. We are dealing here with a phenomenon which eludes scientific laws at present known. The evidence of what happens in certain cases is strong: yet no one can be sure that it will happen in other similar cases. It can be 'proved' but it cannot always be repeated, and since it concerns the abysmal levels of our mental existence, depths that existed before ever humanity possessed 'mind' at all, the results of mental Suggestion can be produced more easily in simple girls like Elizabeth

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Okey than in more complex personalities whose insight into themselves might help psychology to measure accurately what at present it can only see as a shadow. In the end, *The Zoist* becomes wearisome, and gradually we lose our faculty of being convinced by its tendentious pages.

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SURGEONS AND OTHERS

John Elliotson was no more successful in giving to his generation a sense of certitude or even convincing his surgical colleagues when he collected together a series of cases where mesmerism had been successful in reducing or preventing the pain of surgical operations. In view of the shocking scenes of the operating theatres before anaesthetics, we might have thought that any agent able to minimize the anguish of those daily butcheries would have been welcomed. Quite apart from the agonized sensations of these unfortunate patients strapped to the table and dosed with alcohol to deaden the sharpest edge of their pain, we might have thought that even a moderate degree of narcosis would have given surgeons more peace of mind in which to perfect their craft.

But surgeons remained indifferent, and it is one of the strangest chapters in the growth of their art that no improvement in practical surgery can be ascribed to mesmerism, the one means of anaesthesia available before ether was introduced by Morton in 1846, and chloroform by Simpson in 1847. Some surgeons, indeed, made against mesmerism the same objections which they were to advance against chloroform a few years later, namely, the theological argument that pain was beneficial to humanity and that to abolish it even for brief periods would be letting in worse evils.

One of Elliotson's leading opponents at University College

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Hospital, Professor Robert Liston, was himself one of the first to use chloroform for a surgical operation, and that was the end of mesmerism as an anaesthetic. The new anaesthetic was easy to use, and it could be weighed and measured. Once more a physical agent visible to the eye and apparent to the nose obtained primacy in the treatment of disease over one that had no existence save in the soul and imagination. Chloroform paved the way for Lister, and the beginnings of psychiatry were postponed for another half-century.

John Elliotson's fundamental error was to overlook the purely mental means by which 'Suggestion' (an invaluable word invented thirty years after his death by Bernheim) acts upon a second person. Suggestion plays upon the imagination and reinforces the will. It is a mental influence only. Elliotson clung to the abandoned 'fluid' theory, and persisted in his experiments with coin-touching and water incantations. Wakley's forensic mind was easily able to detect the fallacies, and while the physician floundered, the dexterous editor scored a cheap success which had the effect of postponing the dawn of psychological medicine in Britain until long after its rays were seen on the Continent.

But mesmerism was not dead; it lingered several decades. In 1850, an ingenious professor of chemistry in Edinburgh published a powerful defence of animal magnetism in the form of letters to a supposed 'Candid Inquirer'. It is not known whether this latter person was fictitious, or really the Duke of Argyll to whom the volume was dedicated on account of the author's 'high respect for your Grace's ardent devotion to truth', but the book mixes some good sense with much questionable stuff about iron magnets, and the production of an artificial *aurora borealis* visible in a dark room by sensitive persons.

More worthy of regard was another pertinacious Scot, James Esdaile, who went out to India because that was thought a cure for weak lungs, and became a company doctor in the East India Service. His headquarters was at Hooghly, then a village north of Calcutta, where he was in charge of the hospital. He hap-

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pened to read one of Elliotson's papers at the time of the University College controversy, and became fired with the possibilities of being an apostle of mesmerism in India. Esdaile had never seen it performed, but when a Hindoo convict required a painful operation, he risked giving it a trial, and with complete success. There followed 'a complete suspension of sensibility to external impressions of a most painful kind'. With further cases he was outstandingly successful, and he published his results in a lively little manual. Mussulmen are put to sleep, Hindoos are relieved of chronic pain, prisoners have enormous lumps removed, a Brahmin has an arm amputated and feels nothing. We rub our eyes at the simplicity of the process. One patient has hanging from him a mass large enough to be used as a reading-desk and which afterwards was found to weigh eighty pounds. He is hypnotized and the tumour removed. Another swelling weighed over eight stones, and was separated from the patient's body under hypnotism, without a quiver of his flesh.

Esdaile possessed the tact which Elliotson lacked, and he was wise enough to interest officials of the Government in mesmerism and was allowed a small hospital wherein to develop his methods, and was so successful that he was congratulated by the Viceroy, Lord Dalhousie, who gave him promotion and even wrote a letter to the *Morning Chronicle* about this new discovery. Esdaile stayed on in Calcutta, neglecting the chance of a fortune in order to follow his research, and in eight months used mesmerism in 261 operations. He returned home still young, published much vigorous writing about mesmerism in *The Zoist* and otherwise, and died at the age of fifty. He was Elliotson's most capable and successful follower, and undoubtedly he possessed that forcible personality which is the basis of effective hypnotism.

Retirement in his native country did not lessen Esdaile's enthusiasm for mesmerism, and he found that the calmer, more intellectual people of Scotland could be influenced through suggestion, as easily as Hindoo mystics on the banks

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of the Hooghly. Dr. Fraser Thomson, surgeon to the Perth Royal Infirmary, became his disciple, but history repeated itself on the banks of the Tay, and the medical staff agitated against the practice of mesmerism so successfully that the managers put down their feet, and the mesmeric experiments came to an end. In the sixties, John Hughes Bennett, professor in Edinburgh, included hypnotism in his course of physiology.

Bennett's medical colleague, Professor Laycock, had written in 1840 that the actions of the Okey sisters were certainly not feigned. These girls, he said, were of 'the same family as the Pythian priestess, the wizards of Kamschatka, the whirling dervishes of India, the serpent-eaters of Egypt, and the second-sight men of the Highlands', and he concludes that Elliotson overlooked the influence of the will.

Poor Elliotson had come so near to the truth!

I 5

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As the violence of the mesmeric controversy calmed, the Royal College of Physicians felt John Elliotson had been badly used, for, whatever his opinions, they respected him personally, and in response to 'a generally and strongly-felt wish' he was invited in 1846 to deliver the annual Latin oration given in memory of William Harvey who died two hundred years before. This became John Elliotson's swan song, and true to his principle of never shrinking from innovation, he created one more precedent. He delivered the oration in English instead of Latin. The man who had prematurely discarded knee-breeches and adopted side whiskers, used the stethoscope and advocated quinine, who had proposed to make the average doctor an educated man, was not prepared to allow the decent obscurity of a dead language, or any convention of the College of Physicians, to stand

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between him and the promulgation of his ideas. He has learned something in thirty-six years since his first thesis in Latin was nothing more than a compilation of library medicine. The Harveian orator of 1846 announces boldly, in the preface, that it was his duty to declare the truth not only before the College, but in the ears of the general *public*. It was not until 1865 that Harveian orations were regularly delivered in English. Need it be said that the theme of Elliotson's oration was mesmerism?

The deed executed by William Harvey in 1656 in which he endowed the College with his estate at Burmarsh, worth £56 per annum, requires that the Oration shall commemorate annually the benefactors to the College. Elliotson ingeniously bends tradition to his thesis by drawing a parallel between his own experience with mesmerism and the opposition raised to the doctrine of blood circulation. Harvey's practice as a physician in Cromwellian London had dwindled because of that epoch-making discovery which made him immortal. The contemporary wits proved to their satisfaction that circulation of the blood was impossible. 'No physician', declared Elliotson, 'forty years old at the time believed in the circulation before he died, however long his life was spared for reflection.' The great Harvey had exhorted the medical profession to search out the secrets of nature by experiment, and Elliotson makes play with this injunction, the memory of the mesmeric conflict still bitter in his mind. It mattered not, he said, whether the result of scientific investigations would be practically serviceable. Every step further in knowledge of nature must eventually be useful. The mere absence of a spirit of inquiry, with slavish devotion to medical routine, had greatly hampered the progress of medicine. He gives classical examples. Ambroise Paré, the celebrated renaissance surgeon, who tied severed arteries with thread, and renounced boiling pitch as a wound dressing, was violently attacked by his professional brethren. Oliver Cromwell died of ague because his doctors disbelieved in Peruvian Bark (quinine). Inoculation against smallpox had been called a diabolical in-

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vention of Satan, and vaccination condemned root and branch. When the orator himself had first carried into his wards a wooden stethoscope, a lecturer at the same hospital had remarked to his students that there was 'a poor fool at one end of it, and a poor worm at the other'. Elliotson wound up these notorious instances of professional obscurantism with a calmly impassioned appeal to these assembled fellows to follow the spirit of Harvey, and not to believe that any art or science, least of all the art and science of medicine, left no room for further discoveries. With a controversial subtlety not observable in his earlier polemics, Elliotson in this Harveian oration omits direct description of mesmerism, but as the Fellows watched his fanatical eyes, and listened to his highly documented presentation of the ancient theme of heresy hunting, everyone recognized his reply to the accusations made against him eight years before. This Harveian address made no friends for mesmerism, but it rehabilitated John Elliotson in general esteem among Fellows of the Royal College of Physicians, and softened some of the bitterness of professional conflict.

Alas for any more permanent impression. Only four years later, a subsequent Harveian orator, J. A. Wilson, gave thanks 'for all who prefer living in honest poverty, to growing rich by the systematic quackeries of mesmerism'. Another medical writer said that all the mesmeric patients he had met with expressed themselves as worse than before, and did not hesitate to assert that mesmerism is from the devil.

John Elliotson's career is full of tragic irony and possibilities unfulfilled. He had the training, the instinct, and the opportunities to make discoveries, he was a humane man far in advance of his contemporaries. His outlook on medical education was far in advance of his time. Fifty years later his work as a scientific physician would have been more appreciated. A hundred years after, his investigations into psychological medicine would have made him immortal. He was temperamentally interested in the shadowy regions of the mind, and well aware of the deficiencies of the organic medicine of his day, yet he

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missed a first class discovery. Elliotson was the victim of English amateurism well represented by Thomas Wakley, who despite his Greek quotations and Ciceronian epigrams, was essentially an uncultivated man, with the amateur philosopher's cheerful conviction that anything Wakley could not understand was necessarily false. He was the mouthpiece of the average, and philosophical questions interested him less than current medical politics.

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Elliotson, it has to be confessed, never emerged from the earliest phase of Mesmer's own doctrines, a phase which the master outgrew, those pseudo-scientific theories of animal fluid passing between the mesmerist and his subject. Nature had made a psychological radio system with one personality acting as a transmitter of mental suggestions to another mind tuned to receive them. John Elliotson's tragedy was that he recognized this psychological wireless, but was always searching for the wires. He never grasped the nature of the *rappport* or sympathetic understanding between doctor and patient which has been called (by Mesmer himself) the 'uniting of their two wills for the object of cure'.

Elliotson was unfortunate, too, in not finding a really striking case such as Maria Theresa Paradis, and in demonstrating the Okeys too often to the neglect of other features, he showed as little judgment as Anton Mesmer had revealed intuition.

It was left for James Braid to do what Elliotson failed to do and work out the modern basis of suggestive slumber, and to coin for it the inspired term Hypnotism.

Braid was a Scotsman who practised in Manchester and learned something of mesmerism from a Frenchman, Charles Lafontaine, who claimed to have made thirty thousand francs

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out of public *séances* in Manchester, though the admission fee was only half a crown, and, even more remarkable, to have hypnotized, among others, a reporter from the *Manchester Guardian*. Braid took up the method very successfully, and as his viewpoint was radically different from that of the Mesmerists, he had to invent a new name. First he called his system *Neurypnology*, later shortened to hypnology or Hypnotism. He described it in articles for the *Medical Times*, a new journal which was opposed to Wakley's *Lancet*, and therefore glad to applaud anything of which Wakley disapproved.

The whole tendency of Braid's work is to remove the supra-sensual element, and to establish Hypnotic influence as a phenomenon of Suggestion, a link between two imaginations, without any hypothetical fluid or emanation. He gives a reasonable explanation of how Hypnotism works, and his method of producing it is that generally followed to-day. Braid believed that Hypnosis was really a state of mental concentration, in which the mind engrossed by one single idea becomes at the same moment most detached from outside influences, and most sensitive to them. Strangely enough, his greatest influence was in France, from where it spread to the United States. Braid's book had to wait forty years for a French translation, but by then it had created a school of French Hypnotizers. It is from James Braid, and not from Mesmer or John Elliotson, that the illustrious line of modern mental healers springs, by way of Liébeault and Bernheim of Nancy. Mesmer is the Columbus of mental science, but Braid is the Amerigo Vespucci.

In the 1860s a copy of Braid's book on Hypnotism fell into the hands of Dr. Liébeault of Nancy, who used hypnotism in medical treatment with successful results. He was succeeded by an even greater pupil, Bernheim, a more scientifically minded hospital physician. Their example aroused latent powers in a watchful druggist of the same town called Emil Coué, and finally pinned down the hypnotic influence as 'suggestion'.

The most famous exponent of suggestive methods in France was the Napoleonic Charcot, the first to map out the hidden

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neck of land connecting two great continents labelled respectively 'bodily' and 'mental' diseases as formerly a bridge of dry earth joined England to Europe. To his consulting room in the Boulevard St. Germain came paralytic millionaires from all Europe, and the great physician, who was more interested in the story written on his patient's face than in a long history from the lips, held two or three hundred doctors spellbound at the hospital of La Salpêtrière as he employed hypnosis to probe the unconscious cause of symptoms. Charcot, who did not actually hypnotize the patients himself but had it done by his assistant Pierre Janet, regarded the method more as a way of finding out hidden personalities as a cause of illness than as a means of producing a cure.

America received the mesmeric theory through Charles Poyen, a French magnetist who settled in Boston, and who taught a watchmaker named Phineas Parkhurst Quimby. Out of that seedling came the greatest religious application of the idea of mental suggestion, through the church of Mary Baker Eddy. Most profoundly significant of all, to Charcot's clinic came on a post-graduate visit a young Viennese physician who took back home with him Charcot's method, tried it out and then abandoned it for a still more fruitful technique. This was Sigmund Freud, whose science of Psychoanalysis, founded upon an early repudiation of hypnotism, has influenced the twentieth century more than any other mental philosophy, and who, in his native Vienna and later throughout the whole world, passed through the fire of antagonism which would not have surprised Anton Mesmer.

It is hard to deny John Elliotson a vital part in all these developments. Forty years after him, the behaviour of the Okey sisters would have been considered priceless psychological material. Morton Prince had studied Dual Personality at Harvard, and other scientific observers proved the existence of the phenomenon of telepathy. Elliotson's work should have been regarded as a major contribution to mental science. But more than a glimpse of the promised land he was denied.

AN HONEST MAN

The irony of his career lies in the fact that he went through the stages by which his predecessors passed on their way to creative heights, but he remained on the level. He never admitted there was any good in the work of James Braid. Those public *séances* which had been the cause of Mesmer's exile from Vienna and from Paris should have been a warning to him at University College Hospital. Elliotson's futile attempt to make rapid conquests by shocking his fellow physicians into belief, and snatching martyrdom for himself where patient resistance would have been better, reveals the outlook of the previous polemical age. Mesmer suffered on account of gossip and scandal, and the sexual element in psychological illness had been always a big factor in the outcry against the mesmerists in every country. John Elliotson's personal character escaped insinuations of immorality, but his enemies felt that by censuring him they were administering a warning discipline to others.

The dangers were appreciated but not the potentialities. As Elliotson himself wrote: 'When people inquire whether mesmerism is not a dangerous thing, I always reply that I am happy to say it is — a nonentity, an unreal, though alleged power of nature can do no harm: but all real powers of nature will work readily for evil if misapplied. Mesmerism may be abused like anything else.' Yes, drugs can be used to poison unwanted wives, surgery may be exploited for criminal abortion, the supreme invention of aeronautics has been perverted to the most atrocious uses. The whole of modern science is pregnant with evil, and the only hope for humanity lies in a loftier ethical standard.

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In 1850 William Makepeace Thackeray published the second volume of his novel *Pendennis*, which had been serialized during the previous two years. While writing this famous story he had

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been taken ill, and as a dedication to the volume he wrote a charming tribute to the doctor who looked after him: 'Thirteen months ago, when it seemed likely that this story had been brought to a close, a kind friend brought you to my bedside whence, in all probability, I should never have risen but for your great watchfulness and skill . . . As you would take no other fee but thanks, let me record them here in behalf of me and mine.' The physician who inspired these lines was John Elliotson.

He was human enough to take pleasure in such testimony of a patient's regard. On another occasion he observed: 'Pardon me the vanity of saying — "*My friend* Charles Dickens".' There was in his character a simplicity, a certain naivety, and this working through an abnormal restlessness and demoniac ambition made him a man both hated and loved, but never thought of calmly. Even his opponent Thomas Wakley had called him 'that noblest work of God "an honest man"'.

His success in practice made him a comfortable fortune, though, like many another able physician, he was not wise in his investments. He died in 1858, at his daughter's house in Davies Street, Berkeley Square, convinced to the end of the power, safety and future potentiality of mesmerism.

In his obituaries there is a note of respect and pity. No breath of scandal had ever besmirched his personal integrity, yet 'the great error of his life' was sadly lamented by his contemporaries, who thought that the unholy spectre of psychological treatment had been buried with him.

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WAS HE RIGHT?

Can we sum up the merits of the controversy which eclipsed John Elliotson and continues, though at different degrees of temperature, to-day? Anton Mesmer believed in a universal

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fluid which could be mobilized and directed by human agency. This fluid could pass from the human touch, or in water, just as the similar force of electricity flows along a copper wire, or is gathered in a battery, and to make the analogy complete, Mesmer actually formed what he called 'human batteries' by joining the hands of several persons, in that way reinforcing the small charge of the universal fluid which each of them possessed by nature.

What was the effect of this marvellous though hypothetical fluid? In Mesmer's view, it produced fearful crises, convulsive bodily tremblings, temporary but violent spasms of the muscles, which passed into the mesmeric state, and in that condition the patient could be cured of his ills because for the time being his will could be united with the will of the physician.

That was the classic theory from which Mesmer himself never moved; a physical fluid, a disturbance of the aether as we should term it in the middle of the twentieth century, something that was as 'real' as oxygen or as objective as water flowing along the bed of a river.

Out of the Mesmeric fluid came sleepwalking and the universal receptivity of the patient's mind. Under its influence the nerves could feel no pain, provided such a command were conveyed to the subject. Through its supernatural influence, insight was given to the doctor so that he was able to understand, via the brain of a somnambulistic medium, the nature of the hidden manifestations of disease.

Such was the theory that John Elliotson adopted, we might say, swallowed whole. He was trained to think in terms of chemical and physical agencies which could be measured. He was a materialist, a 'fluidist', and did not grasp the meaning of Soul or Psyche or the factors operating inside the patient's imagination.

In this respect he had been left behind even at the date of his professional downfall, 1838. Others saw clearly that the impact of mesmeric suggestion acted through the Imagination or, as we should now say, the power of Attention. Poor Elizabeth and

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Jane Okey were each of them a mass of sensitive organs, able to receive stimuli not from the doctor's touch, or his pathetic glasses of water or his ridiculous 'batteries' of gold sovereigns. They caught the commands from his voice, his face, his authority as a doctor acting through the chemistry of their imagination. Thereafter, they fell asleep, still sensitive to the atmosphere around them. They knew what was going on; like observant children they had subtly gauged the hostility of Thomas Wakley and the supposedly 'scientific' atmosphere of the monotonously repeated performance, and through desire to please, feminine complaisance and hysterically histrionic powers they were able to repeat again and again the marvellous phenomena which so startled the gentlemen who flocked to University College Hospital for a thrill. The moment would come when their more conscious natures asserted themselves, and they became less 'mediumistic'. This was confusing to Elliotson, who believed that an effect must always follow a cause, and to Wakley fraudulent because he thought that anyone who could not repeat the same psychological phenomenon twice over must be an impostor. John Elliotson was drawing away from that excessive absorption in the physical body as seen in the students who watched Dr. Nicolaas Tulp dissecting that murderer's corpse in the anatomy rooms of the Amsterdam Surgical Guild.

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AFTER ELLIOTSON

It cannot be said that hypnotism, as we must now call it since Braid's more lucid conception took the place of Elliotson's imperfect theory, has since made much more progress in Britain. On the Continent, its development has been greater. Myers, an English physician who visited Nancy in the 1880s, was impressed by what he saw at Bernheim's clinic there: heart patients, children with St. Vitus' Dance given sleep and relief;

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old men helped to calm shaking limbs, drunkards and drug addicts given new self-control. Myers found that the great majority of patients could be hypnotized, and he deplored that in England this method was not even treated seriously. John Elliotson's ghost walked abroad. His disgrace, the 'falling away' of an orthodox physician, had left too deep a mark.

The same curious vacuum of interest has continued into the twentieth century, but to-day opinion is changing. Sigmund Freud himself, who gave up hypnotism before 1900 in favour of the method of 'free association', has declared repeatedly that the hypnotic method has possibilities in psychiatry, both in treatment and in mental research.

We are still far from realizing the forecast of Sir Humphrey Rolleston, afterwards Regius Professor of Medicine at Cambridge, who as a young man visited Liébeault at Nancy and reported in 1889 'without taking any exaggerated view of the value of hypnotic suggestion, we may expect that its employment, in functional cases at least, will become a familiar instead of an almost unknown part of practice'. The history of mesmerism in England had not emerged from the age of prudery, evangelical dogma, and social humbug. Even the tremendous vogue of *Trilby* published in 1894 did nothing positive for hypnotism, except to accentuate disproportionately one of its quite inessential features, the domination of an impressionable girl by an inscrutable male who used hypnotic methods, as though such a situation had never occurred before, independently of 'mesmeric' influence!

Modern psychiatry regards the condition of dreaminess or 'mental dissociation' which can be produced through hypnotism as important from a curative point of view, since in that state, midway between sleep and waking, the patient may come to understand forces in his mental life which cause him pain and frustration, and may even expel them from his system. Under hypnosis he is not deeply enough asleep for the painful unconscious forces to be distorted as in dreams. At the same time he is sufficiently conscious to be able to understand thoughts

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generally pushed back deep into the mind. With such knowledge of the way thoughts are repressed and forgotten by the conscious mind, we can understand how mesmerism has always excited such intense opposition, in Mesmer's own day, in Elliotson's revival, and in Freud's adaptation. For mesmerism seeks to unloose thoughts which the whole mental economy requires to be controlled and hidden.

'Repression', or automatic forgetting of painful ideas, is an indispensable mental mechanism which Man has acquired in his long evolutionary ascent. Yet the occasional lifting of this repression is a necessity of culture and art, and a means of curing illness.

To Elliotson's generation that knew not X-rays or microbes, and which had never heard of blood transfusions, high frequency currents, or modern germ killers, the prospects of scientific materialism were much more promising than what could be foretold from animal magnetism. But to our own age, when it is only necessary to conceive some fantastic requirement — new destructive machines, a new ray, a fresh chemical — to have it produced on a large scale, we are less favourably impressed with the ultimate value of material progress. Our eyes have seen the naked resurgence of animal passions long thought to have been civilized out of Europe, and the mass mesmeric displays of Adolf Hitler, the mental enslavement of millions, have made us less inclined to doubt the reality of a mental influence which has such opposed potentialities and can both set free the beast in man and also become the agency of his regeneration.

The control of microbic infections by hygiene and germ killers seems only a matter of time. Plague, malaria, tuberculosis, yellow fever can be banished by knowledge we possess to-day. Even the cure of cancer may emerge from these same devious avenues of biochemical research. The field of environmental medicine becomes smaller each year.

But are we any nearer to solving the most difficult aims of medicine, influencing the emotions, the passions, the fears of

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human beings? what is called to-day 'the psycho-somatic approach', or the investigation of that delicate realm where the functions of the soul mingle with the powers and fluids of the physical body. A third of ordinary medicine is made up of illnesses which have no bodily or organic basis, but are located in the functioning of the body. This section of the art of healing, at present under the stepfatherly care of psychiatry, remains obscure through want of faith, want of hope, and that by-play of the instincts which we can see in every human experience, yet cannot see how to emancipate.

John Elliotson might have been the pioneer in this department. He might have been an English Freud. His tragedy lies in the fact that through some defect of temperament, an irritable impatience to see results, a certain fatal gullibility and lack of humour he was unable to give a sense of certitude about the reality of mental phenomena to that full-blooded, very dogmatic Age then on the strong tide towards conquest of physical matter and energy. He lacked Freud's stoical indifference towards contemporary disbelief. John Elliotson failed in big things, and by the size of his failure we can estimate a man even better than by success.

He deserves to be thought of as an eminent Victorian who ventured into an incomparably obscure underworld and there lost his way.

Is not John Elliotson's career merely one more episode in the great cyclical conflict between the spiritual and the material?

RURAL HEALERS

RESEARCH in medicine to-day tends to become academic and seemingly apart from the main current of sickness and health. We are in the streamlined age when every activity has to be big, well publicized, and above all, conducted in an atmosphere of apparent efficiency and organization. But it was not always so: and will not always be so. Nature's secrets are not necessarily whispered to the well-equipped searcher. Often Nature is coy, and reveals herself to the amateur who works in loneliness and with self-made tools.

Here is a story of discoveries of primary value which were born out of unorthodoxy, and narrowly escaped being lost altogether because the begetter was something of a misanthrope, quite careless whether he made either money or reputation. If you have the misfortune to break your leg, or your young nephew suffers from hip-joint disease, orthopaedic science will produce the cure. It is the art of caring for injured joints and guiding them back straight. We might say that British orthopaedics arose out of a special instance of family devotion, to be described here, a case of hereditary skill, as closely cultivated as that of the Cecils for statesmanship, or the Bachs for music. In the work of Hugh Owen Thomas it is impossible to distinguish between art and science, just as in the bonesetting of his forebears it is mostly art, and in that of his orthopaedist successors it is largely science that predominates.

These Thomases were Welsh farmers on the Isle of Anglesea. They were also preachers and poets; earnest theologians on the hard benches of Methodist chapels each Sabbath, who justified God's ways to men and ploughed stony soil, wrote Welsh verses, and were eloquent in both languages. But the Thomases had a sideline: even on hillside farms, men break their bones and strain their joints, and the family were known in that part of

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Anglesea to have strong sympathetic hands, and a great fascination for their neighbours' aches and fractures. For several generations they were called into such cases, and naturally they worked up their methods into a kind of hereditary mystery, handing them down as a cult from father to son. In 1830 one of them a certain Evan Thomas, became tired of the farm, made the family hobby into a professional calling, and settled down in Liverpool as a practising bonesetter, just as he might have done as a carpenter or a butcher. He took a house near the new Liverpool docks where the first generation of the industrial revolution swarmed. Dock workers provided ample material for the wonder-working hands of this Welshman who lived 'two doors from the chapel' and he soon developed a large connection. Stevedores with twisted knees, porters with sprained shoulders — every kind of cruel disaster and deformity which toil, heavy weights, damp, disease and falling cranes could inflict upon the human body — they were all clinical material for Evan Thomas. His methods were conservative, he believed in rest, and had the right instinct for placing injured joints into their best functional position. From these rough men around the seaport he received devotion, and as the inevitable consequence, the scorn of regularly trained surgeons. In their eyes, since he had no university diplomas or degrees, had been to no college or medical school, and never opened a textbook — he was a charlatan.

Not that medical degrees and qualifications were so important a hundred years ago as they have become to-day. Until 1832, when the Anatomy Act was passed, there were still private establishments where dissections were carried on, but in that year, which followed the Burke and Hare outrages, the privilege of learning anatomy direct from the human subject became restricted to regular medical schools. Even so, medical and surgical practice did not possess the legal status achieved in 1858 when the Medical Act set professional examinations on a proper footing. When Evan Thomas worked in Liverpool, the bonesetter and village healer were much more accepted figures

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than to-day. Surgeons, physicians and apothecaries began their studies, not through matriculation, but by apprenticeship. Then with Pasteur and Lister medicine and surgery suddenly woke out of a long sleep and began advancing with giant strides.

In the eighteen-forties, Evan Thomas, though he was considered an outside practitioner, was revered by the common people who would let him do anything with their limbs. He seems to have had a protective sense that his own art had limitations, and frequently referred his patients to qualified doctors when he came upon ailments that were outside his own range. But in his own line of accidents and deformities, he was supreme.

There was no winning magnetism about this man. No one ever consulted him for his charming personality. His manner was gloomy and forbidding, and his consulting room devoid of any show. One of the proofs of his success was persecution. His enemies were on the lookout to detect any slip, and three times Evan Thomas was prosecuted for manslaughter at the Assizes, and had to justify himself and his treatment before judge and jury, with a prison sentence hanging over his head. But he succeeded, and was three times acquitted. There must have been a general idea around Merseyside that his practice fulfilled a need.

Another sure proof that this man was exceptionally intelligent was the fact that he realized the days of the old-fashioned bonesetter were numbered. He believed in his craft, but resolved that the next generation of Thomases should have the advantage of medical training and thus be secure from professional jealousy. He had five sons, and he sent them all to Edinburgh University, where they qualified as orthodox medical practitioners. The eldest of the five who thus entered medicine with a background that would be impossible to-day, was the undersized, frail Hugh Owen Thomas, who became the creator of modern orthopaedics, though he never used that word. With the other four sons we are not concerned here, for they did not inherit the father's talent.

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It is necessary to remind ourselves that there was then no organized doctoring, no clinics or out-patient departments, and in the year when Hugh Owen Thomas began practice, the only Government Health Department, the General Board of Health, in existence was swept away by reactionaries in Parliament.

2

YOUNG DR. THOMAS

Hugh Owen Thomas was a medical student at Edinburgh during the year before Lister made surgery safe, and when chloroform was only just making modern operations possible. It was the age of transition just anterior to modern medicine based on the germ theory, a time of experiment, one of those moments in history when the original mind feels at home. William Macewen, whose portrait appears further on in this collection, came ten years later when Listerism was founded. But Hugh Owen Thomas, though he practised mainly surgery, was not an operating surgeon in the sense that Macewen was, but a general practitioner.

The Welsh student from Liverpool had no thoughts of becoming a professor. Even before going to college he had already passed through an apprenticeship with his uncle, a country doctor of the qualified variety in Wales, and of course he had helped his father at bonesetting near the Liverpool docks. He was dedicated to the family calling, and after a few months of walking the wards in London and Paris, he returned to Liverpool and started practice in the year 1858, when the Act was passed conferring a professional status on trained medical practitioners. It was a symbolic date. He was qualified just before the door closed.

The next year his father, Evan Thomas, by now a widower, married a second time, and his disgruntled eldest son left his

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father's home and started on his own the practice of human joinering.

The father had worked on haphazard lines in bare rooms, and when splints and appliances were needed, they were made in crude fashion. The father performed his manipulation and left the rest of the treatment to nature and the patient's relatives. His son's exact intelligence wanted to control the whole procedure from start to cure, and the first step was to organize his own surroundings. How few workers with hand or brain realize the handicap they create for themselves by not organizing beforehand the help they need from their environment!

Surgery is the most experimental of arts, yet how rare true originality is in the essentials! It is easier to build a new hospital at the cost of a million pounds, than to make sure that old-fashioned methods of treatment and nursing are not preserved inside those new walls. In the primary arts of life we suffer from the most rigid inertia. But Hugh Owen Thomas threw overboard all his accumulated ballast. He was a genuine, a freakish 'original'.

To control the whole course of healing in a complicated case of fracture, making the process like a scientific experiment under his own eyes, he decided to have each mechanical appliance made to his own ideas, by his own workmen, just as any other experimenter would. There was to be no vague ordering from an 'instrument maker' who had never seen the patient. Thomas looked for a suitable house for his surgical headquarters, a house of special size, for no one consulting room was large enough to contain the crowds of patients who would flock there. There must be accommodation for a smith's forge and workshops for the manufacture of splints.

In Liverpool, the medical fraternity gathered chiefly in Rodney Street, which is still the centre of professional renown. Hugh Owen Thomas seems to have looked for a house there, but he found nothing to suit his special requirements. It is symbolic that he should settle down in a street called after an even more celebrated admiral than Rodney, as though thereby to prove

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himself superior to professional custom even in the place of his residence. Nelson Street was his choice, and there modern British orthopaedics was born.

On Sunday morning the free clinic was held. Hugh Owen Thomas broke away from the Calvinistic faith of Wales, and became an agnostic, and it gave him sardonic pleasure to carry on his medical practice at the hour when the bells were ringing for church. In the house were mechanical lathes for making irons and splints, and a blacksmith and a saddler turning out every variety of mechanical support for injured and diseased limbs. There were cubicles where he could rapidly examine one patient while another was getting undressed. This extraordinary house in Nelson Street, Liverpool, so unlike any other doctor's residence, was the factory of orthopaedic tools, as well as the nursery of its principles.

The master of the surgery became a familiar character in those riverside streets. His two-horse equipage with a scarlet body and brilliant red wheels, designed by himself and executed on his own premises, carried the slight, nervous, mercurial Welsh doctor, never without a nautical peaked cap, pulled well down over his left eye, and smoking an eternal cigarette, long before cigarettes were in fashion. It was said he began smoking to ward off danger in a cholera epidemic and never gave it up, which shows that his mind was not uniformly scientific because the protective effect of cigarette smoke must have been negligible. He always wore a long heavy overcoat buttoned up to the collar, and large gauntleted gloves. His working day began at six in the morning, and, after breakfast on tea and bananas, continued with few intermissions until bedtime when Mrs. Thomas played on the piano the 'Dead March in Saul' which was his favourite soporific. An 'original' certainly, and among the doctors of Liverpool in the seventies and eighties, a self-made exile. He isolated himself by his strenuous daily timetable, and a contempt for ordinary ideas, ordinary methods, which he delighted in putting into words. He was content to work incessantly among the men of the docks as his father had

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done, wrenching back their dislocated shoulders, padding their splints, setting their fractures. He never needed to wait for patients, they came to him more readily than they would go to hospital, and twenty-eight workmen's friendly societies around the docks made him their medical officer. He had the true clinician's knack of making every case contribute to his own knowledge, but these patients never thought he was experimenting and they did whatever he asked. Not that he ever asked or used persuasions. They were scared of him, but he gave them certitude, and a high average of good results. He was a widely read man, not above picking up hints from old and forgotten authors such as Fabricius Hildanus who flourished in the seventeenth century and had metal splints made for him by an armourer. Perhaps from him Thomas derived his adhesive strapping made up of pitch and resin, and very useful for holding a fractured limb in place.

In the centre of his surgery stood a machine for reducing dislocations of the shoulder. There in a steel chair of this fearsome contraption sat the patient while others watched the performance with breathless interest and heard the snap as the bone slipped into place. Thomas was showman enough to see the value of the wonder and expectation aroused by the very slickness of his manœuvres. To make sure that no one but himself tampered with a broken bone once set in its metal splint, he would seal up the fastenings with wax, embossed with his own signet ring. For everything this man used self-invented scientific methods, and like all true innovators, he knew that living experience was more important than a bit of mechanism. To him the joint was not an isolated hinge between two bones, but part of a system of locomotion and posture, made up of muscles, nerves and feelings, and the complex mechanism acted as a whole. His patients could afford only simple ways, and they needed discipline if his methods were to have a chance of success. He wasted no time, spoke brusquely, gave orders that had to be obeyed, and insisted that each of his clients pay him something — as a part of the state of morale required for their cure.

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Every technique, as soon as it becomes second nature, tends to grow sterile, but Hugh Owen Thomas escaped this danger so perilous to the specialist. His methods were always changing, and since he lived intensely, working against time, there was no opportunity for him to get stereotyped.

Bitter controversy still surrounds the status of the bonesetters, their descendants and disciples. We shall not pursue here what is nowadays historical, and more a question of professional organization than of the art of healing itself. Thanks to the life work of Hugh Owen Thomas and his nephew, Robert Jones, whose career, presently to be described, completes the work of his uncle, these truths which the bonesetters possessed have been incorporated into modern orthopaedics.

3

THE BONESETTERS

These uneducated healers like Evan Thomas were quite innocent of an exact knowledge of human anatomy, except what they picked up with their eyes and fingers, and rather prided themselves on that limitation. They produced their cures, and the fact that they did produce cures is undoubted, by a combination of tactile sense, intuition, experience, and self-confidence. The danger was when they made errors in diagnosis, perhaps moving a joint affected with tuberculosis, to the patient's grave injury. Yet some of them avoided such dangers, and learned instinctively to distinguish between a joint which would benefit from movement, and one which should be left alone. It was empirical, but perhaps no more so than some other parts of medicine and surgery. Evan Thomas, in his slow clumsy way, had worked out a regular technique of resting a joint at one stage of the trouble and moving it at another, and his son's sharp brain had noted and perfected the method.

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When a painful area exists in a joint, the nervous system, in an effort to protect the joint from accidental movements which would increase the pain, throws the muscles into a spasm, and makes the joint as stiff as possible. This rigidity of the muscles is a protective reaction, and Hugh Owen Thomas saw that it should be preserved as much as possible by rest and splinting. At another stage, the joint has to be moved to prevent permanent stiffness. Hugh Owen Thomas was unusual in his day for having fully grasped the teaching of an older English surgeon Hilton, that rest properly used was curative. Thomas believed that 'Nature cannot be hurried and all we can do is not to thwart her', as he said. He was the first man to apply rest diligently, thoroughly, and with concentration. He seized on these two notions of rest and movement each at its proper time, worked them up into principles, and carried them out in a rational practice.

Some of his methods described in actual cases are of fascinating simplicity. Merely by damming the circulation above and below a fractured bone he was able to make it heal in six weeks, although previously it had refused to join for fifteen months. It was a result which might have been predicted by any acute and imaginative reader of a physiological textbook, but before Hugh Owen Thomas, no one had thought of trying it in practice.

He employed his father's idea of active movement to restore the ends of bones into their sockets, and to bring back use to stiff joints. What the slow-moving father did blindly, instinctively, the son did with reason and with a knowledge of anatomy to safeguard him from harm.

Bonesetters have flourished for generations in all parts of the country, but especially in mining and industrial communities. A famous example was Richard Hutton, a London upholsterer, who gave treatment in his spare time and taught his methods to Dr. Wharton Hood, whose father, a country practitioner, had attended Hutton in a long illness. Feeling a debt of gratitude, the bonesetter impulsively offered to communicate his

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secrets to Dr. Hood, Senior. But the old doctor said he was too busy, but would be glad if Mr. Hutton would renew his offer, and teach bonesetting to his son. And so the young Wharton used to go along to Hutton's house, and watch this rough untutored man use his strong hands, and often equally strong language, upon the crowds of patients. When he handled a joint, there was usually a 'click' and this Hutton sincerely believed to be the bone going back into place. It was probably nothing but the snapping of a tendon or ligament, but Hutton would say confidently to the patient: 'Did you hear that? Well, now ye're all right, use your limb', and the patient, whose knowledge of anatomy was hardly less than Mr. Hutton's, for that was nothing, would generally throw aside his crutches. At first young Wharton Hood used to put awkward questions, asking Hutton to explain exactly how it happened. But the learner soon found that this scientific curiosity took him nowhere, since the healer had grown old in his bonesetting faith and could give no real explanation. If the pupil wished to learn, bonesetting had to be accepted just for what it was. He put it all into a book which was the first scientific account of methods such as Evan Thomas practised in Liverpool. Wharton Hood's book *On Bonesetting* is readable and still fresh after eighty years. The doctor's son had profited by his opportunity.

These bonesetters were sometimes called 'rubbers' because of their use of friction and massage, but the impact of their personalities on the patient was the principal part of the cure. The masterful bonesetter with semi-hypnotic powers imposed his will upon a patient 'whose case had resisted the doctors'. Taking the painful joint in his hands, he made rapid manipulations, and the pain was suddenly better. Such was the legend.

The reality was rather different. For every success of this kind that could be trumpeted abroad, there were many failures, and even disaster needing to be followed by an amputation, as when a tuberculous joint was forcibly moved and the disease accelerated.

This very existence of the art of bonesetting implied open

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criticism of orthodox surgery, an attitude which makes a subtle appeal to the patients' emotions, since many people are more willing to be cured by a genius claiming special gifts and inherited secrets, than by the regular practitioners whose methods are to be found in a medical textbook. In the art of medicine it is advantageous for the healer to have a prejudice on his side. An anti-professional bias has often been the means of cure.

There must be new doctrines, at first resisted, then absorbed, and digested slowly. There always will be quacks and pretenders, as well as genuinely inspired healers possessing vocation but no medical education. Great protestations, *causes célèbres*, before the General Medical Council are journalistically interesting, but usually occur after the cause has been won through intellectual permeation of an idea. Modern orthopaedics has now embraced the technique of the bonesetter, but a hundred years ago it was different.

In 1867 Sir James Paget, then not at the height of the great reputation as a surgical teacher he was afterwards to attain, writes, thoughtful and rather puzzled, on the subject of bone-setting, but the title of his article in the *British Medical Journal* — 'Cases that bonesetters cure' — shows that he recognized uneasily that there was some value in these unorthodox performances. To the medical profession he says: 'A few of you are likely to practise without having a bonesetter as your enemy; and if he can cure a case which you have failed to cure, his fortune may be made and yours marred.' And to help them he breaks up the vague list of ailments where the bonesetters were at home, into a number of more reasonable categories, and shows that good diagnosis and gentle manipulation are safer and more helpful than the violent wrenchings which some of the less intelligent bonesetters used. The sincere Sir James is also wise. He tells the surgeons, his pupils and colleagues to be willing to learn even from their enemies, and to find out what was good in bone-setting.

Naturally-taught men like Richard Hutton and Evan

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Thomas concentrated on their narrow field with monomaniac intensity, and thus achieved their successes. In the early days when Hugh Owen Thomas started practice the great consulting surgeons were too busy in other spheres; anaesthetics and Listerism had made their work more varied and exciting. In place of the old sawbones, who prepared for a big job merely by turning up the sleeves of a Prince Albert jacket, the new surgeons were actually wearing clean aprons and using a carbolic spray. Soon they would dress in sterilized garments from head to foot. After Lister, wound infections were largely banished from hospitals, big tumours were being removed with safety by Lawson Tait of Birmingham, who showed that the abdomen was no longer as forbidden as the interior of Tibet. It is not surprising in the midst of these triumphs of surgery that the aches and sprains of the manual workers were overlooked as of trivial interest. If a dock labourer broke his arm, nature would usually make a job of it, even though nature's results were sometimes a little clumsy and inconvenient. Other joint troubles were chronic and generally not fatal. Except for Hugh Owen Thomas, who regarded these joint troubles as a major department of surgery, no one bothered — except the bonesetters, and thus began the gulf between them and orthodox surgery which lasted unfortunately eighty years after Lister.

Osteopathy is the corresponding development in America, where in several States it is recognized side by side with modern medicine. It has drifted away from simple bonesetting and now sets up as a whole system of medicine with its own methods, doctrines, colleges, diplomas, but it has not made headway in this country and has been refused legal status.

Hugh Owen Thomas had absorbed all that was good out of his father's practice, though he revolutionized his methods. The son was no great admirer of the old ways. He often stated that, although some of the old bonesetters were superior to their qualified contemporaries, this did not apply to their general knowledge or practice. 'Concerning diseases of the

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joints', he says, 'I never met with the slightest evidence that any of them had any knowledge of the subject or a method of treatment which was not utterly wrong.' This shows that he did not over-estimate them, and that he realized their main services to the art of healing were practical and empirical, and they possessed nothing worthy to be considered a body of original knowledge.

4

AN AGNOSTIC'S FAITH

However, from a professional point of view, Hugh Owen Thomas suffered greatly through his father's reputation in Liverpool, and the bitter memory of the trials for manslaughter. Not that he obtained fewer patients, or less credit around the riverside slums. The poor, who could not afford to be away from work an hour longer than was essential, found that his new methods were practical, even though when a dislocation had to be reduced, he sometimes preferred the effect of surprise to the solace of anaesthetic. But as a whole, the medical faculty paid no attention. He was never on the staff of a hospital, and taught no undergraduates. The University never gave him an honorary degree, and the Liverpool Medical School, which to-day has a Professor of Orthopaedics, grew to maturity officially unconscious of his existence. Hugh Owen Thomas was not the man to ask for credit, even for his own ideas: indeed, he went out of his way to make those who disagreed with him lifelong enemies. He quarrelled with his father, and was not on speaking terms with his brother, and in medical controversy he was the born dissenter. Not for nothing was he an admirer of Charles Bradlaugh. That perpetual thorn in the flesh of late Victorian England, one of those natural-born Popes who find professional competition so serious that they become atheists,

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wrote at Thomas's death, 'On his grave, gently and uncovered, I lay a leaf of reverent tribute'. In his very agnosticism, Hugh Owen Thomas showed an inverted Calvinistic intensity belonging to the Welsh hills.

Though disbelieving in formal religion, Hugh Owen Thomas had his own scientific faith, and when the accepted pundits preached ignorant doctrines on bone and joint injuries, his Welsh eyes flashed lightning, and the tongue that his forefathers used for poetry and worship poured forth his professional beliefs.

He ignored invitations to address medical conferences. The few medical articles and books he wrote were set into type by a jobbing printer around the corner, and published privately, and he never bothered whether anyone ever read them. Even so, his volume, *Knee, Hip and Ankle*, reached America and brought admirers on a hurried visit to Nelson Street, as they passed through Liverpool, while Hugh Owen Thomas was still virtually unknown by his city brethren. Transatlantic interest did not prevent Thomas from engaging in an acrimonious controversy with some New York surgeons. It never dawned on him that his theories might flourish more through tact than polemics.

In his general practice he was obliged to handle other cases besides orthopaedic ones, and he rather specialized in the treatment of intestinal obstruction by careful management, but without operation. His method needed five or six visits each twenty-four hours. The treatment and diagnosis of abdominal diseases were at that period in a confused condition and even such very different states as typhoid fever and acute appendicitis were successfully treated by Hugh Owen Thomas on identical lines. His ideas can be seen at their characteristic best here, since intestinal obstruction (stoppage of the bowels) is a condition requiring a kind of internal orthopaedics. In the seventies, hospital treatment for acute abdominal emergencies was not possible, because there were few surgeons, and fewer surgical beds. Such methods as he used are now only historical,

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but they illustrate his beliefs, and his surgical ingenuity in carrying out the idea of absolute rest with the most elaborate and meticulous care.

Patients of Thomas's, and particularly their relatives, were obliged to be thoroughly co-operative, for they never knew at which moment in the twenty-four hours the little Welsh doctor, smoking his cigarette, would swoop down the street in his dog-cart and appear like a dark sprite at the bedside, before even they heard him open the front door. His eyes noted everything, and his tongue spared no one who failed to carry out his routine to the last drop of water. The suffering patient was the only one in the household to whom Hugh Owen Thomas gave any heed. A shrewd, sharp, peppery man, cynical in many ways, he knew that human nature values what it pays for, and is inclined to trifle with what it gets for nothing. Therefore, although he was indifferent to pounds, shillings and pence, and gave away generously what he saved, he insisted that every patient pay something. One of many grim legends gathered around him is that once when Thomas had put a dislocated shoulder back into its place, the patient demurred at having to pay five shillings for what seemed a very brief and easy manipulation. 'Too much, is it? Well, we'll soon put the shoulder out again for you', replied the sharp little man with the cigarette smoke obscuring the gleam of his eyes beneath that extraordinary képi, and a fresh myth was born of Dr. Thomas's fearsome style. But such tales merely added to his reputation for brusque individuality and did his practice more good than harm. With primitives such as the Mersey dockers, this wholesome respect for his tongue and his occasional 'downright frightfulness' as Frederick Watson, a sympathetic biographer, has put it, was the only discipline to make them carry out his carefully planned routine.

There is something inspiring in the details of his work, as though genius gifted with superhuman patience had seen far below the surface and found there laws of perfect simplicity to be applied with an obstinacy like a natural force. This inven-

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tive general practitioner created his own methods, his collaborators, his instruments, then challenged the destructive powers of nature with the superior guile of one who had stolen her secrets. The aggressively open agnostic, whose prayer might have been 'I disbelieve, O Lord, confirm and strengthen mine unbelief', was at heart full of faith. The source of his certitude lay in his strange flair for finding scientific laws. In that kingdom he was fully at home, and through its bracing inspiration this inquiring unbeliever was able to communicate his faith to others.

His career is the standing refutation of standardized medicine, and strong proof that research requires attitude and aptitude that are inborn.

It would be easy to present the work of Hugh Owen Thomas as a triumph of the general practitioner, but it would not be entirely true. He was unlike any other medical practitioner, as his mechanical methods differed from those of the average instrument maker. It was not that he made discoveries because he was medical guardian to a few hundred families along the Mersey docks, but that he applied his exceptional talent to common problems such as every club doctor meets, and to-day hands over to an orthopaedic specialist. He was a skilled observer who used his general practice as a scientific laboratory, and made his patients prove his ideas upon the mutually agreed compact that they carried out his orders implicitly, knowing how he devoted himself to each case on an individual basis, and they preferred even his biting tongue to going to hospital. He was a mechanical genius and made useful appliances for joint injuries as skilfully as orthodox physiologists made them for animal experiment. His test of value was the pragmatic one — will it work? — and in answering this question no one was more austere than himself.

An immense concourse of riverside workers followed Hugh Owen Thomas to the cemetery. To his contemporaries, he was a poor man's doctor, an eccentric, deliberately obscure figure, and when at the age of fifty-four he wore himself out through

THE TORCH CARRIED ON

long hours, his hunger for improving his methods was still unsatisfied, and his work might have died with him. He had never taught medical students, had given no hospital demonstrations, had often antagonized even those who divined that this sharp-tongued city doctor was an arch craftsman in the line of master surgeons. He was one of those individualists who never accept the notion that another person can do the job as well as they themselves. A sublime selfishness protects their life work. Like jealous mothers, they brood over it, with protective resentment of outside help. Hugh Owen Thomas was one of these self-sufficient guardians of his own idea. It is almost as though he desired his work to remain secret like the cult of his forefathers.

It was here that fate took a hand and rescued his labours from the oblivion that must certainly have followed when Hugh Owen Thomas died in 1891. He was not buried in a cathedral and no hospital ward was named after him. When he passed away the medical profession did not regard him as one of its leaders. As to his capacity for successful medicine, men and women living around the Liverpool Docks had a surer instinct when they followed him to the grave in thousands.

5

THE TORCH CARRIED ON

Some years before, with no thought of gambling on the future, Hugh Owen Thomas had adopted professionally a nephew of fifteen. This boy became his unofficial assistant in the surgery, while he was attending the Liverpool Medical School. His spare hours were devoted to an apprenticeship at 11 Nelson Street, where he absorbed the uncle's austerity before learning theoretical medicine from the hospital teacher. The youth, who was called Robert Jones, qualified in medicine at twenty-one, and later became a Fellow of the Edinburgh College of

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Surgeons. He had grown up in the surgery, knew the call of the night bell before he left school, and was adept at fitting bandages and preparing lotions at an age when other medical students are squeamish at their first operation. While the Manchester Ship Canal was being built, Jones spent a useful period as resident surgeon and saw many new kinds of injuries. It was a revelation to him to measure the cost of human injury of this great engineering enterprise. While Liverpool was connected with Manchester by a highway of water, he was able to enlarge his self-confidence, gaining immense experience such as comes the way of few aspiring surgeons.

The uncle cherished the idea that this young relative would in due course carry on his practice. Probably he can have foreseen no brilliant future for the young man, or believed that anything more than comfortable succession in a tradition of bonesetting, now become respectable, could be his nephew's niche in the future. Hugh Owen Thomas was not a man to care for prestige, and he can have had no glimpse of the prophetic nature of what he was doing when he formally invited nephew Robert to join the partnership.

The young man's nature was temperamentally as opposite from his as any could be. One photograph shows them together at a period when the nephew was newly qualified, and the uncle near the end of his days. The youngster's frank, round, characterless face stares pleasantly, with an impression of dreamy sincerity; what a contrast with the older man's sharp eyes glinting suspiciously beneath the brim of his cap, the pair of nervous hands seemingly impatient of idleness, and, as he buttons up the well-known double-breasted ulster, the impression of wary, satanic authority over the innocence of the fresh young man who leans awkwardly over the back of a chair. Hugh Owen Thomas could not have found a disciple more unlike himself if he had searched a hundred years. In that picture is the contrast of dynamic force, with calm and so far undeveloped tenacity. The old man seems to hold his cigarette at the end of his mouth by mere will-power. He breathed a



HUGH OWEN THOMAS AND ROBERT JONES
circa 1885

THE TORCH CARRIED ON

devil of work and practical resourcefulness into the easy-going soul of his nephew, and in so doing made sure of his own immortality, and what would perhaps have secretly pleased him more, the development of his ideas.

This Robert Jones had gifts of humour, kindness and a singular power of making people like him, and believe in his ways because they enjoyed his company. He was a graduate of the University, and because of his personal popularity the medical profession in Liverpool were more ready to overlook his awkward family connection with bonesetting than they had been with Hugh Owen Thomas. Where the uncle had made bitter enemies, he made admiring friends. On the old man's death, the young surgeon of thirty-two took entire charge of the consulting rooms at 11 Nelson Street, introduced some innovations, made experiments with the first X-ray apparatus used in this country, and gradually, through force of circumstances, gave up the general part of the practice and specialized in orthopaedics. The consulting rooms at Nelson Street became more cheery when presently Tom the butler, well known to the neighbourhood and to patients from all over the north of England, took charge. As surgeon to the Southern Hospital, Robert Jones was responsible for teaching students, and he was a member of the new coterie of Consulting Surgeons. It was as big a transition from the mixed practice of Dockland as Hugh Owen Thomas had made away from his father's bonesetting, and a great step in the growth of orthopaedics. Robert Jones was a man no one could resist and he had as many warm admirers on both sides of the Atlantic as his uncle had opponents.

The mystery is how this easy-going, popular, all-round man developed the intense passion for craftsmanship which even surpassed in range that of his uncle. Breakfast at 7.30 a.m., twenty-six operations between lunch and 9 p.m., seven thousand patients a year on Sundays at his free clinic — this routine was kept up for over half a century, together with overflowing hospitality, watching cricket matches, being a spectator at the

HUGH OWEN THOMAS

boxing ring, and entertaining at home a widening circle of friends and gratified patients. Yet Robert Jones was seemingly as vague and unorganized as his uncle was definite and concentrated.

Until the first world war orthopaedics was no well-defined speciality, at least in Britain, but Robert Jones made it one, spending his days manipulating joints, splinting fractures, correcting deformities, applying the ideas of Hugh Owen Thomas. Robert Jones never stopped speaking of his uncle, making for him a halo, and the mercurial brooding spirit of the older man burned inside him, driving him forward in that never-ceasing professional routine which seems so out of character in the smiling, absent-minded, good-natured man, with the walrus moustache and cherubic face.

The Practice of Hugh Owen Thomas had been a personal affair between him and the patients who came in multitudes to Nelson Street. The man himself had no interest in wider issues, and his practice allowed him no leisure to organize anything outside the immediate interests of his patients. Medical politics, charity on a large scale, schemes for providing treatment, and the modern movement to prevent those conditions which he spent his life trying to cure — the whole trustification of medicine which is the centre of health activity to-day — were beyond Hugh Owen Thomas. He was no friend to the planners. His pragmatic view of surgery as the treatment of diseases by surgical routine did not include glimpses of preventive methods, and he was incapable of understanding the vast public health organization required to abolish tuberculosis and rickets, which were two principal feeders of his surgery in Nelson Street. He would have said such planning was a waste of time. But his nephew had the vision to inspire others to do what was so appallingly necessary at the beginning of this century.

Though he was not interested in the wider outlook, Hugh Owen Thomas had perceived that his individual methods needed for their scope more equipment than the average doctor's surgery. His nephew went further and realized that proper

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treatment for crippling deformities in children, due to rickets and infantile paralysis, required a completely new type of hospital which had not yet come into being. Robert Jones handled children to perfection, he loved and understood them. Crippled boys and girls had become prominent in his practice, and with them came ideas of curing deformities by three agencies which were absent even from the well-ordered cubicles at Nelson Street. These principles were sunshine, open air and play. They were new of course only in the sense that they were not yet thought of as practical politics for slum children.

Hugh Owen Thomas had a realistic notion of what his patients could afford out of their family budgets — not more than a perambulator in a park, a few days perhaps at New Brighton, and the best that many of the children could hope for was a life spent on crutches. Deformities were looked on as inevitable curses, and the preventive idea that we now take for granted was only dawning even on a progressive thinker like Robert Jones. The crippled child lived in an atmosphere of sentimental resignation. But a more vigorous psychological attitude towards these child victims was ready, as it were, in the womb, and at this point destiny provided the woman to bring it to birth.

6

ENTERS THE NURSE

A certain very respected family of Shropshire gentry included one genuine Victorian eccentric, the mother of eleven children, a woman of dominating character, who never resisted her own sense of adventure. When she was informed that Angora goats might be reared on a lonely island off the coast of Australia, she promptly departed there with her young family. Angora

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goats turned out badly, and the lady impulsively returned to England, where she plunged into charity visiting, being driven round to call upon her cases in an open donkey cart. She solved the problem of keeping dry on a rainy day by inventing a mackintosh cape with two holes. Through one of these, Mrs. Hunt put her head, and through the other appeared her driver, with disastrous results when the lady got out of the trap forgetting their Siamese attachment. One daughter, Agnes Hunt, who wrote the raciest memoir ever penned by a nurse, had developed joint disease, but recovered sufficiently to train as a nurse in a hospital. She taught herself to become the founder of orthopaedic nursing in England. Equipped, as she put it, with this hospital experience and also with 'the great education of pain' and with a certain family unconventionality fostered during the sojourn in Australia, she began nursing work on a district. It was desperately hard work but Agnes Hunt did not lose her power to relax, and she owned a horse named Bacillus and a dog named Germ. After some years of arduous work under conditions that to-day suggest a concentration camp, she settled down quite unknowingly to her great work. Of this new departure which is a new chapter in orthopaedics her Victorian mama was unconsciously the cause. 'One day', writes Agnes Hunt, 'mother broke it to me that she was becoming too old and deaf to do her work in London and that she intended to live with me. This was rather a blow.' But as usual Mrs. Hunt had her way, and with these inauspicious beginnings a convalescent home for children was opened at Baschurch, on the joint income of mother and daughter. A mere eight shillings was the weekly charge for a patient. Very soon the house was full, and moving children encased in splints up and down the stairs became a minor administrative problem. The only solution seemed to be housing some of the patients outside in a shed. The open air regime was being talked about, and so, with a naive literalness which brings to mind the early saints, Agnes Hunt made a virtuous principle out of her necessity. New accommodation was found

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in the garden. The results were surprising, and thereafter the open air treatment thus accidentally adopted became the rule at Baschurch.

This unconventional nurse in charge of the establishment slept in an open air shed together with some of the patients, and brought her extraordinary humour, a freakish sense of the ridiculous, and a strong will power to the work of overcoming obstacles merely by refusing to acknowledge their reality.

At first, this ramshackle *ménage* had nothing to distinguish it from other children's homes, but soon it began to take in crippled children, and presently these became the majority. Thus in a few sheds, the first orthopaedic hospital in the world had been created. It was in the depths of Shropshire, and from time to time Agnes Hunt, who was herself crippled through return of a childhood disease, herded a noisy group of her little patients by train to Liverpool, where they were wheeled to the Southern Hospital by railway porters. This heroic and pathetic group in the corner of the out-patient clinic touched the easily stirred heart of Robert Jones, and at once Agnes Hunt felt the compelling magnetism of his presence, 'in which one could not spend five minutes without feeling that all was well in this best of all possible worlds'. To do away with the need for these tiresome journeys to Liverpool by train, she nervously invited the great man to become visiting surgeon to her primitive establishment, and he, without considering for a moment what effect such a new responsibility would have on his already overcrowded timetable, agreed readily.

On his first visit, the great surgeon went to sleep in the train and nearly missed getting off at the station. That was a suitably informal introduction to a very unorthodox establishment, but the gaiety of Agnes Hunt turned everything to good account. A professional symbiosis of mutual trust and complementary efficiency grew up between them, and Robert Jones performed the operations while Miss Hunt performed the rest.

Thereafter, those unconventional train journeys to the hospital and back, with several children on the floor of the

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carriage in various splints, became less frequent. 'We had found a man who could really help us', she says, and Robert Jones never failed to attend to the most unusual of his professional commitments.

Fun and games, both those lawful and those forbidden, were a great feature of Baschurch, where by practical demonstration, the notion that a crippled child had to be petted and pitied was effectively scotched.

Success with children demands keeping alive the child in oneself, and certainly both surgeon and sister had this delightful qualification. Agnes Hunt puts her practice of child management in a few sentences. 'It was considered a great honour to be operated on by Sir Robert Jones, rather like winning your cricket cap at school. They were always allowed to choose their own supper and had special toys given them on the morning of the operation. They went smiling to the operating table and took their anaesthetic without a tear, even the five or six year olds.' Child psychology was certainly understood in those open air sheds at Baschurch. Robert Jones was the visiting genius, yet a child among them too, outstanding even in that atmosphere where strange things happened. Not even the accidental descent of the great surgeon's trousers when he was busily engaged in an operation caused any undue fuss in that exhilarating place!

None but two such enthusiasts, endowed with the experimental outlook and quite unhampered by theories of how a hospital should be managed, could have achieved their success. Robert Jones, the great surgical opportunist, would use any means that served his purpose. Dame Agnes Hunt knew by native intuition that the crippled child can be taught to overcome almost any physical handicap simply through rest and open air. Between them they taught the world that those admirable principles which Hugh Owen Thomas discovered in the slums of Liverpool worked with even greater rapidity when accompanied by sunshine and patience. Agnes Hunt is one of those powerful humorous saints who pass through

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bodily suffering only to gain from it greater spirit and deeper insight. Illness has intensified her will to communicate to others the simple laws by which deformities can be recognized and cured.

Agnes Hunt has never been robust in health, yet her own sufferings gave her even more sympathy with the crippled children, and intensified her willpower to organize the hospital, teach the nurses and remain constantly alert for new ideas and fresh methods. What pathos there is in her simple words: 'In 1924 I contracted lupus and had to give up active work.' But that intermission was only the beginning of a fruitful period of organizing the Cripples' After Care.

The famous hospital at Baschurch which was thus founded in the manner worthy of a fairy tale, out of a stable and a few sheds, grew to over 300 beds and was marvellously rebuilt on more conventional lines, losing perhaps thereby the old sense of improvisation as a matured organism leaves behind its gay childhood. Used during the first world war as a centre for military surgery, then moved to another site and renamed after its two founders, the Robert Jones and Agnes Hunt Orthopaedic Hospital has become a shrine.

Robert Jones inspired a whole school of workers to conquer the misery and deformity of the crippled child and for such cases he had shown that surgical operations, in the narrow sense, can be largely superseded by rest and proper splinting, and that the most successful orthopaedic surgeon is he who least often uses the knife.

After hospital treatment came after-care, and the slow period of training for the new life; Sir Robert Jones and Dame Agnes Hunt knew that cripples have often done great things in the world by a mere effort of over-compensation, once they had taught themselves not to give way to inferiority and self-pity, and that this faculty of self-regeneration is not the prerogative of genius, but can be achieved by an average slum child. In the seventies, these urchins had lain lonely in orange boxes, their limbs fixed in one of Hugh Owen Thomas's horrible

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inventions. At Baschurch, though still in splints, they acted plays and learned football and picked up trades. That was the difference. The disease was the same but the outlook was revolutionized.

By his gifts and extraordinary magnetism, Robert Jones was able to go further than his uncle along the road which began with a few prayerful farmers and now is a highway lit with achievement. It is not perhaps strange that Dame Agnes herself, who had undergone 'the prolonged education of pain', should so intimately sympathize with the crippled child, but it is remarkable that a man like Sir Robert Jones should possess such depths of understanding. He had good health, congenial work and worldly success, yet he always appeared to take a dilettante's joy in ordinary living. When operating he was never nervous, never at a loss, and he used the minimum number of instruments. He never snapped at the anaesthetist or the nurses, nor threw instruments petulantly on the floor, and while he made no effort to be a leader, everyone rushed to follow him. The last phase of that crowded surgeon's life came in the first world war, when he was in charge of military orthopaedics, and organized services for the soldier with bone and joint injury as he had done for the crippled child. He swept away elaborate and useless gadgets for correcting deformities and restraining fractured bones. War demanded that splints should be useful, adaptable, and standardized. Something very simple and practical was required, such as could be used in casualty clearing stations as easily as in base hospitals. Robert Jones bent a piece of soft iron into an elongated hoop and attached it to a leather ring as he had been taught to do when a boy in Nelson Street. It was new to the army, but he had known it for forty years. It now was named the 'Thomas splint', and at last immortality came to the founder of orthopaedics. An American surgeon said that the Thomas splint did more during the first world war to prevent death from shock than any other single measure.

ORTHOPAEDICS IS BORN

7

ORTHOPAEDICS IS BORN

It is one of the familiar ironies that Hugh Owen Thomas should live more on account of this simple contrivance than through his lifetime of discovery. The Thomas splint is only the peak of the iceberg which reminds us that nine-tenths is submerged beneath that magnificent eminence.

Can we sum up the range of this effort of study given to one field of surgery? From the year when Hugh Owen Thomas began practice to when Sir Robert Jones finally laid down his scalpel, passed over seventy years, the working life of two industrious men, enough for a great secret to be found and exploited. Hugh Owen Thomas poured his whole life into his work, as though with a premonition that his days would be brief. He took no distraction, no holidays, attended no tedious medical meetings. Possessing the true creative instinct, he was too much wrapped up in his work even to consider whether it might survive when he was there no more.

His own contempt of professional propaganda is part of the pride proper to artistic gifts. It is as though he believed only in personal initiation, and was willing to hand on his discoveries in the way masonic rites are communicated, by the personal sharing of experience, such as is possible only with a few. Joining that dedicated household, the boy of fifteen absorbed the outlook and the method, while remaining quite untouched by his uncle's misanthropy. Evidently nature had created a genius in two parts, a transmitter and a receiver. Even without those fifteen years of initiation with his uncle, Robert Jones would certainly have possessed his own genius for the art of living, but perhaps not become a great surgeon. As it was, he never managed to look the part. He appeared rather more like a kindly amateur yachtsman. Yet his instinct was so sure and his touch so delicate that embittered war pensioners would let him handle them as easily as would little children. He was

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ready to operate anywhere if there were a job to be done, this stoutish, smiling, amiable gentleman, who usually lost his railway ticket on a journey and managed to carry through an enormous daily programme despite a nature from which formality and routine had been somehow omitted.

In the subject-matter of orthopaedics during these seventy-five years, we see an enormous expansion, not only of technique, but of material. Even Thomas's practice was mainly in workmen's injuries and some children's deformities. The great mass of crippling diseases, the results of tuberculosis and rickets, the hunchbacks, the twisted limbs, were beyond his horizon because the spirit of his age treated these misfortunes as inevitable and incurable. Hugh Owen Thomas might give relief to a child with a tuberculous knee joint, but the larger prospect of complete functional cure, and the even wider one of prevention were beyond the range of what he could achieve in his severely practical view of surgery. The chance that came to Robert Jones was to apply and greatly extend his uncle's ideas into a system of preventive surgery, and this work has been carried on for already ten years after his death and the outlook has changed. Some of the problems of Nelson Street have been solved. Diseases like tuberculosis are less common, but biological surgery on bones, joints, muscles and nerves has become a permanent influence in the healing art. The tiny flicker which came to life in the consulting cubicle of Hugh Owen Thomas is now an illuminating beam.

If ever two members of the medical profession differed, these are they. The uncle was temperamentally at war with his fellow men and his patients' respect had more than a touch of fear. He was at his best working alone, scornful of help, and his neglect of professional opinion was not merely inverted egotism, it was a deep-seated individuality. Robert Jones was the most homely and gregarious of men, and when he was buried in Liverpool Cathedral the world of doctors knew that a great surgeon and a lovable man had been lost to them. Yet the want of resemblance between Hugh Owen Thomas and

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his nephew is only on the surface, for as we watch them practising their art they fuse into a single personality. Through heredity, or by intimate association, or perhaps because of a spirit of place hovering in those cubicles at Nelson Street, they had like ideas, used similar tools, and achieved the same end in the treatment of their patients.

From which we may infer that though doctors have always differed in relation to one another, their attitude to medicine shows the same indivisible tradition of surprising constancy down the ages.

PART FOUR

JAMES MACKENZIE AND WILLIAM
OSLER

JAMES MACKENZIE AND WILLIAM
OSLER

ONCE upon a time, the physician was a very scholarly man who sat in a library and studied black-letter texts out of leather-bound folios. His inspiration lay in some earlier member of the faculty who had translated into English an Arabian version of Galen's Latin, and whose theories of disease were founded on what someone else believed Galen believed; Galen, the Roman physician of the first century who had never dissected a human body in his life, and who thought the arteries contained not blood but air. These old physicians lived on legends about disease, and there was more than a trace of ritual in the way they signed their prescriptions and murmured a Latin phrase for a symptom which was beyond understanding. They were the learned men of medicine when medicine was a branch of archaeology. But whenever a mechanical procedure was required, such as cupping, or bleeding, or the dressing of a wound, they called in one of the members of an inferior craft — a leech, or apothecary, or even a surgeon who at one time was little more than a glorified barber, and one of these sub-professional handymen did the job. The physicians were intellectual leaders, at home with ideas but not where it was necessary to use instruments. The rules of their own London college allowed them to prescribe, but not to make up medicines, and they jealously kept out anyone of the inferior branches who presumed to advise how and when drugs were to be used. The physician was the consultant, the thinker. Medicine was conducted on the same terms as philosophy. In comparison with these scholars the surgeon was a mere artisan.

Then came the great change. Since the days of Joseph

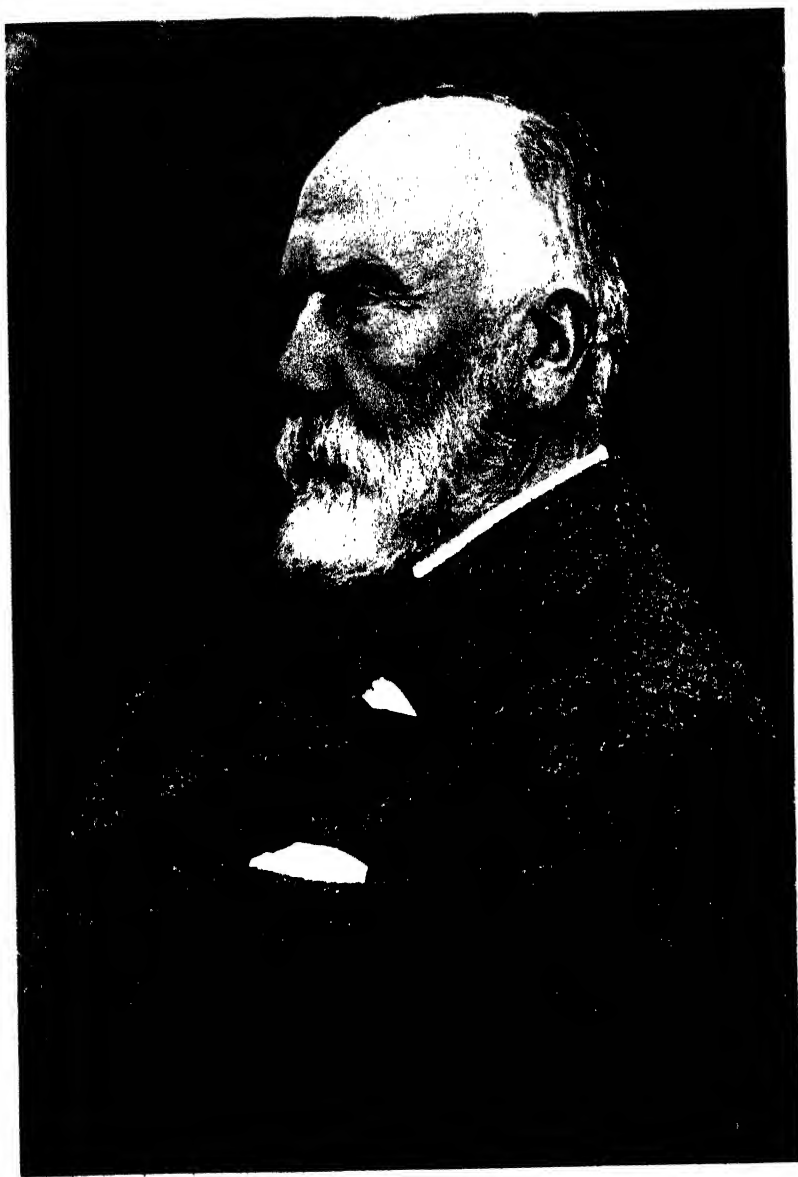
JAMES MACKENZIE

Lister, surgery has held the spotlight, for the surgeon is able to dramatize his cures. He can remove a whole organ like the appendix, make new channels between the stomach and intestine, he can take away films of skin and fragments of bone and cause them to grow in strange places. New operations were made safe through antiseptics, and painless because of anaesthetics, and for two generations the pure physician was overshadowed. The patient began to think he could 'do nothing', and his mainstay, the bottle of medicine, was coming to be the byword for a debased kind of faith-healing.

There is no Marxian formula in medicine, and the purely functional distinction between physician and surgeon has become less marked ever since the beginning of this century. The Physician, or as he is now known in America the Internist, has come back into his own as the philosopher of medicine, the master of diagnosis and the director of treatment. He attends surgical operations and is glad to learn from them. A great British surgeon described himself as 'a physician doomed to the practice of surgery', and his fellow surgeons all over the world now employ drugs, vaccines, serums, each year making more use of the physician's methods. Every step of progress in pure 'internal' medicine seems to take away some of the importance of surgery. Already, septic infections, abscesses, inflammations are treated more with drugs and penicillin, than with the knife. Tuberculosis and syphilis provide less work for the surgeon every year, and before long even the treatment of cancer may come to the physician's department of the hospital.

Once more, the healing of the sick tends to become a single art, and we are moving in the direction of the idea that the human body reacts to disease with the whole of its faculties.

This great revival of 'internal' medicine, which is as much a feature of the twentieth century as the revolution in surgery was of the nineteenth, is very largely due to James Mackenzie and William Osler, who belong to the line of the great classic physicians, and the like of them will never be again. They were both exponents of 'internal medicine', both enrichers of medical



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TALENT FOR RESEARCH

thought at the start of this century, yet as strange a pair of opposites as ever used a stethoscope.

James Mackenzie was a serious Highland Scot, with flashes of genius and flashes of silence. On waking to his own strength, he started laying about the giants of medicine as with a great Highland sword.

William Osler was by temperament a Latin, catholic in all his tastes, a man of restless fascination. He was at home in Toronto, Philadelphia, London, New York, Oxford, and wherever there was a library, physicians to talk with and young men to encourage. He wrote a great textbook, he inspired students with the irresistible adventure of medicine; altogether he was a more colourful personality than James Mackenzie, though his influence on medicine was less original.

Which of them made the greater contribution? That is an unanswerable and unnecessary question, and they are presented here as a synthesis, two halves of a great prototype, purely imaginary, since no human being was ever equal to the greatness of being both Mackenzie and Osler.

2

TALENT FOR RESEARCH

Somewhere in the mythology of nations there is the legend that gods are created out of earth, ordinary common soil, which becomes the Godhead, serves its divine purpose, then is broken up and returns once again to the ground. The talent of the great discoverer passes away with him, vanishes in the dust and ashes of his body, and lives on only in others who caught fire from the eternal spark which inhabited the clay out of which he was made.

James Mackenzie shows that the capacity to make great discoveries in medicine is an accident, a sport, and cannot be cultivated. It does not lie with honest toilers, or with the

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brilliant talent. No number of fellowships or scholarships can produce it. For a brief space of time, the spark inhabits a piece of human earth, and for that period a man becomes a god.

Mackenzie was drawn to the study of the heart. Why he chose it has not been explained, and is probably unexplainable. Out of this special study he gained a glimpse of the fundamental laws of medicine.

The heart is instinctively recognized as the monarch of the organs. Natural speech puts it higher than the brain. We say, 'his heart rules his head' — meaning to convey a compliment to someone who is warm-blooded, emotional, sympathetic. Physiologically speaking, the heart is the pump which sends blood to every organ of the body, yet the heart is much more than that — everything more. It is the governor of the circulation, and through it emotions are expressed in so many active and significant ways. Watch how the heart beats in fear, note how it slows down with determination, observe how it leaps with joy. That heart and its satellite blood-vessels expresses the whole range of feeling, and when the senses are asleep, the heart goes on, infinitely responsive even to dreams. No wonder that heart disease makes up a large part of medicine.

James Mackenzie was the first modern physician to apply original methods to the study of the heart, and his discoveries through his own personal way of looking at heart diseases have fertilized other parts of medicine, and proved that there should be no such person as a 'Heart Specialist', since the heart's behaviour, for good or ill, must affect every other part of the body.

3

THE HIGHLAND BOY

There was a day when boys from Scottish Highland farms finished gathering in the harvest, then, with a pack on their backs, trudged to one of the four university cities. There, in

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wretched lodgings, living on oatmeal and a barrel of herring sent from home with the local carrier, existing on whisky which was cheap, theology which was intellectually bracing but emotionally stultifying, and ambition, that most inexpensive of all sustenance, they laboured at books through the winter, with an occasional tramp homeward and back, until the spring came, and they finished their lectures for six months, and went back to be herdsmen and ploughmen and chew over the precarious learning of the college. From such a typical Highland farm came James Mackenzie in the eighteen-sixties, to Edinburgh University. He passed examinations without distinction, and made no mark as a clinician or researcher, or anything else: just a tall, dark, ruminative highlander.

Men of that type fill surgeries all over Britain and posts of responsibility everywhere. When young they are desperately hardworking and submit to all sorts of humiliations to pay off debts. They mellow into kindly, dignified gentlemen, rather conservative, ultra sensitive, with all sorts of cults of clans, kilts and special brands of old whisky. Often the fire that made them endure so much to get an education dies out, and these men of gigantic endeavour who as students sat up all night reading without visible disturbance next day, slide into respectable mediocrity. The struggle has been too bitter, the obstacles too remorseless.

Before going to college, James Mackenzie had made his first start in life as a chemist's apprentice in the city of Perth, but he had insight enough to realize this was not to be his fate, and walked back home to tell his father that he proposed to spend four further unremunerative years becoming a doctor.

Mackenzie was one of those discoverers who have to find their own way, and perhaps because of his late beginning he found academic work hard, and he steeped himself in authority, always ready to bow the head in order to learn.

Textbooks in Mackenzie's days had only just emerged from the old scholastic outlook, and they contained few illustrations and no coloured plates. Knowledge was made difficult by

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professors in skull-caps, physicians in the old infirmary who taught an authoritative outlook on medicine, the point of view that somewhere in a textbook there was truth to be found. In Edinburgh the medical school has always been noted for its austere absence of credulity and reliance upon the hard way of argument and proof. Yet there was a strong theological atmosphere, and though some of the best minds were absorbed in church politics, the medical teachers in the sixties and seventies were all-round men whose knowledge was not confined to the subject-matter of their professorships. In after years, Mackenzie was to find that this wide outlook had equipped him well for practice, especially in a town which was far from a seat of learning.

He made notes, examined his patients according to the orthodox methods, memorized his lists of drugs, and by the standards of his time was well prepared for practice. He had no professional or social influence, and few hopes of becoming a teacher, and he showed a strong mistrust of his own capacities. This curious humility of his had no justification. His brains were above the average, and in this primeval-looking figure there was raw material of the rich personality that was afterwards to charm his fashionable patients.

Before taking his degree (wearing, as is the custom, a hired gown and hood) he signed his name to the Hippocratic oath, that hallowed form of words, in which the father of medicine, Hippocrates, solemnly bound his disciples to practise honourably. After a year's internship in the Royal Infirmary, Mackenzie looked out for an opening in general practice, and found it in Burnley, an East Lancashire mill town. His choice was accidental, and he might have found himself in any other town. His beginning in medicine shows that he was not planning a 'career'. He was drawn to his opportunity through the blindness of instinct.

He came to Burnley in the days of shawls and clogs, smoke and overcrowding, with prosperity one year and catastrophe the next. Lancashire still clothed the world in homely cotton,

THE HIGHLAND BOY

from the loincloth in Bengal to the pinafore in Kensington. But from those cotton mills short yellow men with notebooks were soon to carry away the secrets of their Lancashire apprenticeship to Yokohama, and with them the ascendancy of towns like Burnley.

James Mackenzie became assistant to a bachelor doctor who had himself inherited the chief medical practice in the town. James Mackenzie's way of beginning his career was uniform with that of thousands of general practitioners. He can have had no ambitions, no strategy of success. Yet unconsciously he had chosen the field where his own peculiar talent could best find itself, and from the first he was happy in general practice. Soon, patients were asking for the clever young Doctor Mackenzie, quite eager to attach themselves to the rising star, and, handsome and hardworking, he occupied the top floor of the old doctor's house, on a salary.

His first teacher in this very varied working-class practice was of course his principal, a man who had lived a lifetime in Burnley, and could read the faces and constitutions of his patients as easily as the local newspaper. Mackenzie began to realize that the medicine of the college was different from this deep, almost instinctive wisdom which his chief possessed, and it dawned on him that such knowledge could be gained only by prolonged first-hand contact with the patient.

Medical practice in Burnley in those days was like pioneering. The doctor had to take all his instruments in the back of his trap, and be prepared to stay on his round all day. There were no convenient telephones to save his time, no clinics to take responsibilities off his hands, few hospitals to receive serious cases, and no laboratories to back him up. The doctor had to collect his fees for himself, but his book-keeping was elementary, and there were fewer certificates to sign than to-day. His people were less sophisticated and less conscious of their rights than panel patients have become. This Highland youth had the physique necessary for an arduous existence and he thoroughly enjoyed the routine of medical practice, varied by

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billiards, chess and good company, and when presently he married a local girl, there was no reason why he should not remain contentedly in Burnley, the prosperous pillar of small-town practice, one of the men who are referred to patronizingly as 'the back-bone of the medical profession' by those who speak on behalf of doctors. That, in one way, James Mackenzie did become. His qualities were so intensely normal as to be extraordinary, and the use he made of an entirely typical experience of medicine raised him to the supra-normal.

To begin with, he was an all-round doctor and never a specialist. He attended midwifery cases, he performed emergency operations, he did all the tiresome routine dressings. He made up his own medicines, and at this period, before the proprietary medicine craze had begun, compounding drugs was still an art. He was physician to the local Victoria Hospital, read medical journals and textbooks, and he consulted fellow practitioners when he was in doubt, and that was frequent. For James Mackenzie's character had a strong infusion of self-tormenting mistrust, and he felt personal reproach when he failed to give relief, where his treatment would not act, when his art seemed hopeless. He always concluded that the fault was in himself and that he must go back again and learn from the great teachers.

Then, one day, he woke up to the fact that even this ideal body of medical principles on which he built everything was a dream, a hangover from student years. 'I was brought to a realization of the fact that I did not understand the full meaning and significance of a single symptom', he says naively, waking to the fact that real clinical medicine which he was so ready to learn at the feet of authority had not yet been born.

James Mackenzie realized with bewilderment that he was professionally speaking as mature as his teachers. In some ways he knew as much as any doctor who had ever lived. He was as capable of forming a judgment as those professors who had taught him. That is to say, his ignorance was at least no greater than theirs. The lamp of clinical medicine was but a feeble

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light in aeonal darkness, and the way to understand more, to be able to do more for his patients, was to strike a spark for himself rather than to trust to borrowed illumination.

Looking over the field of medicine, heart disease, kidney disease, those mysterious enigmas of the nervous system — wherever he looked he saw the same meagreness of genuine knowledge. Of the vast area, he chose for himself a little corner, and began to collect material about heart diseases.

The magnetism which draws the young doctor towards a particular specialism is strange and powerful. It makes one man an operating surgeon, dedicates another to looking down a microscope. It is like falling in love, and out of it springs the best of which a man is capable.

Many years later, Mackenzie declared that no physician could concentrate exclusively on a single organ without losing touch with proper medicine, and of course on general grounds he was right. Nevertheless, from the point of view of craftsmanship, a deliberate devotion to one particular technique is needed. James Mackenzie was a specialist in the sense that he gave to the study of the heart the enthusiasm and the leisure of his best years. He incubated his speciality out of a small seed — a few chronic heart diseases in the back streets of Burnley, and certain home-made instruments used to measure their symptoms. The world called him a Heart Specialist, whereas he was really a speculative philosopher. But this is all thirty years later.

For the present he is only a General Practitioner with a monomania.

4

HEART TROUBLES

Heart maladies last a long while, for the diseased organ can never properly rest, but must go on beating seventy times a minute for as many years as life spins out. The physician must

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find out what dangers menace the heart's action either now or in the future, and take measures to relieve the strain thrown upon it.

Many boys supposed to have heart disease following rheumatic fever are forbidden to play football. Innumerable young men have been refused life assurance because of supposedly damaged heart valves. Was it really necessary for those boys to live invalid lives? Should the young men have been accepted for life assurance? Mackenzie found that these accepted rules of practice were based on vague traditions which no one had ventured to question. In later years Mackenzie was to say that the only two questions of any value in estimating the state of the proposer's heart were left out in the average insurance company's proposal form. To find an answer to these clinical conundrums Mackenzie sat down at the patient's bedside to watch. Metaphorically, he never moved from the bedside for the rest of his life.

He found surprising paradoxes. A man said to have severe heart disease at the age of twenty-five might live hale and happy till the age of seventy; a young woman whose heart disease had never been noticed, might perish unexpectedly in childbirth, a great tragedy, and a reproach to preventive medicine.

When Mackenzie began his work, the only instrument in use for investigating heart diseases was the stethoscope, through which the doctor listened to the sounds the heart made as it beat inside the chest, sounds made up of the contraction of the heart muscle, the closing of the valves, and the rushing of blood through narrow orifices.

These sounds had become standardized to the trained ear, and when the heart valves were diseased, the clear normal sound was replaced by a softer note called a 'murmur'. These murmurs were like false notes on a flute or, to give a more prosaic illustration, the 'knock' of a motor-car cylinder. Before Mackenzie, these heart murmurs were treated as infallible signs of heart disease, and the physician's tendency was to pronounce

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that a loud murmur meant a serious disease of the valve, and *vice versa*. Such an inference rested more on a vague tradition than upon actual experience, and some persons lived healthy all their lives in spite of resounding murmurs.

Besides murmurs, the heart is subject to changes of rhythm in which the beats become irregular, even to a sort of delirium. The causes of this were not well understood.

These heart murmurs and irregularities had become so standardized in medical textbooks that their proper relation to the sick patient was obscure. It was part of the mechanical view of illness, and the results were tyrannous. On account of these theories men and women were condemned to years of needless anxiety through fear of sudden death. Because of these defects in professional knowledge, valve disease had become an organized terror.

Being satisfied that the kind of knowledge required to prophesy the outlook for such patients, and to reassure them, did not exist in books, James Mackenzie set out to watch his 'heart' cases to see how the heart really behaved under the stresses of life. Did the man with a heart murmur really die earlier than a normal man? Those missed heart-beats — did they reveal a grave illness, or only (as some optimistic patients supposed) merely beats 'stored up', and available to be used later in so many extra years of life. These were easy questions to propound, but even Mackenzie might have been dismayed if he had realized how they would pursue him till the end of his days. He was to follow many a false trail, and he must observe those 'heart' invalids for thirty years, during which time he himself was not standing still. His own heart was beating too, and his arteries were feeling the strain of pursuit, excitement and anxiety. In such a quest the physician takes long risks.

Professional opportunity Mackenzie shared with thousands. In his day, it was more common even than now for a doctor to stay in one place long enough to do what Mackenzie did, and of course every medical practice has its heart cases. Other doctors were sympathetic men, deeply observant, doing their best

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to understand and cure. Yet none achieved what he did, the founding of a new clinical medicine.

To gather accurate knowledge of heart function, he needed heart records that could be filed and consulted ten or twenty years later. There were no instruments in existence for this sort of observation, and so, like the man of the island in Hugo's *Toilers of the Sea*, who first made an anvil on which to forge his tools, Mackenzie had to create his own measuring apparatus.

His first aim was to find what the four chambers of the heart were doing, for as will be explained, the heart is made of four hollows which operate, to a certain extent, independently. He needed a living record linked with time signals, thus showing how the chambers acted in relation to one another.

Mackenzie's earliest instrument to make a permanent record was nothing but a pillbox with a piece of rubber stretched over its mouth and a tube connected to the inside. The rubber-covered mouth of the box was then placed against the patient's chest, and the heart, beating, caused air to pass into the pillbox, then along the tube to a tiny lever which moved up and down with each heart beat.

The next problem was to make this frail lever write while it moved. The method used in scientific laboratories was to bring the lever into contact with smoked paper, which moved on a revolving drum. The lever wrote waves on the moving paper, and, with careful manipulation, a tracing of the heart beat could be kept up for minutes at a time.

In general practice, Mackenzie had to make his heart records when he could, and not always when he would. When he had a patient with a heart disease he wished to study, he must first fix his pillbox tambour over the chest, then arrange the lever so that it lightly touched the smoked paper. That smoking process in itself was an irksome operation. He would go into the kitchen and set fire to a piece of camphor (which gives a very smoky flame) then allow black carbon to settle on the paper. Too much blacking would clog the lever, too little of it made the tracings unreadable. Sometimes an imp of mischief would take

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hold of the whole contraption, and the lever would refuse to work — possibly because the rubber was too tight. When that trouble was attended to, perhaps the paper would slip, and the black be smudged off. Or the patient might become restless and the whole business would have to be put off to another day. It was clinical research under primitive conditions. The home-made apparatus had to be carried in the doctor's bag and brought out now and then when there was an opportunity.

Once he had achieved clear tracings of the heart beat, Mackenzie wished for comparison, to add a second line of curves representing the pulse from the veins of the neck. For this, he had to gum a tiny piece of straw to the patient's neck and persuade one end of it to jump up and down upon a vacant area of the blackened paper. Presently, he added a further pillbox in contact with the pulse at the wrist, and this gave a third row of curves. Later on even a fourth recording tambour was brought in to register the pulse at the opposite wrist.

In a low attic of a Burnley weaver's cottage we can picture lying in bed a young girl, the victim of heart disease. There, absorbed in what he is doing, is the bearded doctor adjusting his tubes, his fingers flicking the levers as though commanding them to write. The blackened paper moves on a clockwork spool, and the levers jerk in obedience to the rhythm of her heart, and she hears the doctor grunt as the four rows of hillocks and troughs are scratched — white on the black surface. After long preparations, after failures from the pure cussedness of mechanical things, she is content to see from his face that he is satisfied.

What have these spidery lines on the black paper to do with the pain in her heart? Will he be able to give her relief? Will all this bother ease the pain or cure her swollen ankles? She watches him hold these bits of black paper with concentrated care, and before he leaves varnish them so that the black with its message from her heart will not be rubbed off.

When Dr. Mackenzie has gone, the family would discuss these conjurings with rubber tubes, proud of what he has don

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in their house. Even the poor girl herself feels somehow the better for this experiment which she knows to be connected with the growth of knowledge, though it brought her no immediate benefit. We may be sure that Dr. Mackenzie was never refused permission to make tracings. His patients would have let him cut off their heads. Their faith in his integrity and the ultimate value of his work went deep.

In the next house he might attend a midwifery case, or even perform a major operation, for James Mackenzie was an all-round man, and as far from being a cranky specialist as any doctor could be. At the end of the day in his sitting-room, while his wife played the piano he pored over the tracings, noting the humps and troughs, working out the cycle of the heart and pulse. More important, he would compare tracings taken previously from the same girl a year ago, five years ago. He was making similar records from all his heart cases, accumulating a series of heart-stories, revealing the ups and downs of life, how effort and illness and childbirth told upon the heart.

As he scanned his smoked curves on the Burnley evenings, Mackenzie's Calvinism forbade him to accept easy views of ready-made solutions. Now he had overthrown the authority of his teachers, his nature compelled him to accept a lifelong burden of investigation with short triumphs, long blank periods confronted by a mass of details for which doing a jigsaw puzzle in twilight is a feeble comparison. He was using nothing but pure instinct and human reason to trace a way through a maze of living phenomena and find just one clue to the law of the heart rhythm.

Reading the completed story of a piece of medical research, one may get a false impression that everything fitted a plan, and that once the home-made apparatus had produced the tracings, all the secrets were clear. That would be a misleading notion of Mackenzie's work. His difficulty in making his gadgets work was nothing to the intellectual labour of forming a theory that would explain those curves. The real research was

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done in his head, and gradually, he came to dispense with the instruments, once he had learned what they had to teach. He went on accumulating such evidence *from the same patients* for thirty years. The heart spoke a language of which no one knew the grammar.

5

HEART MEDICINE

To follow the discoveries which Mackenzie made, it will be advisable to lay a finger on the pulse, and follow in imagination the course of the blood as it flows round and round.

Human beings share with mammals, from whales to mice, a type of pumping organ for the blood which works on unique principles. The heart's muscular walls go on alternately squeezing and relaxing. The heart beats even when removed from the body — under proper conditions of warmth and moisture — for days and weeks.

The heart muscle has to have a signal to make it work, and this signal is provided by a tiny electrical current which passes along special muscle fibres that wind around the heart embedded inside the muscular wall. The result of this stimulus passing along the conductor is that the four chambers of the heart beat at slightly different moments, although the interval between is only a fraction of a second. Of course, nothing of this was known to him, and Mackenzie was trying to discover the natural order in which different chambers of the heart contract.

Let us follow the course of the circulation though the system.

The stream of blood comes back to the heart from the veins of the body, entering it by the right upper chamber (right auricle), then passes through a valve to the right lower chamber (right ventricle), a much more muscular affair with inch thick

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walls. This right ventricle drives the blood stream against resistance, into the lungs.

Returning newly oxygenated from the lungs, the blood stream reaches the left upper chamber (left auricle) and passes down through a valvular opening to the left lower chamber (left ventricle) and from there is pumped once again throughout the arteries of the body. William Harvey discovered all this in the reign of Charles I, but now a new set of laws, in their way equally important, was to be revealed by James Mackenzie.

Although an armchair observer might think it more sensible to understand first the laws of the normal heart before going on to the heart when diseased, the actual process of discovery was just the opposite. What is perfectly 'normal' resists analysis, but when nature begins to stumble, we can see the trick of how she manages to walk. One major calamity that can affect the heart is called 'heart failure', and from these cases Mackenzie learned more than from years of watching the healthy heart. In 'heart failure' the heart gives up the struggle — not indeed completely, for that would mean sudden death, but the effort to maintain a satisfactory circulation. Blue lips, swollen ankles, shortness of breath, which are the result of this hampered movement of the blood, had been described by Greek and Arabian doctors, a thousand years ago. The classical theories as to the cause of 'heart failure' stood like a medieval fortress in the centre of a modern city. Mackenzie's genius lay in walking round this ancient citadel and blowing his horn. His understanding of heart failure was founded on the accumulated evidence of his curves on smoked paper.

What was it he revealed? The extraordinary fact that the four chambers of the heart may 'fail' independently and the unity of the four chambers is lost. Sometimes the two auricles (the upper chambers) beat on their own, and in such cases the heart works as two parts, the upper auricles acting as one organ, and the ventricles beating in quite a different rhythm.

Once he had realized that the heart could be functionally divided against itself, he went back over his previous records

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and found cases where the two upper chambers were not really contracting at all, but were in a delirium of ineffectual beats. Yet at the same time in those cases, the ventricles or lower chambers of the heart were beating normally. Most remarkable of all was the fact that such patients seemed comfortable, and even unaware of what was going on in their hearts.

Mackenzie had discovered that man could live and move and work with only one half of his heart beating properly. Yet such a man was on the edge of disaster; though certainly the blow might be delayed for years. The day came when suddenly, for no reason, this delirium of the auricles would overflow, and affect the ventricles too, and the whole heart, ventricles as well as auricles, was now thrown into the mad disorderly rhythm. This time the result, as seen in the circulation of the blood through the arteries and veins, was very different. Disorderly acting upper chambers did not matter quite so much, since their function is more passive; but irregular ventricles meant that the main pumping force was weakened. This time, after years on the threshold, it is true 'heart failure'.

This discovery led to an advance in the treatment where the rapid irregular beating led to 'heart failure'.

The leaves of the purple foxglove when gathered at a certain season and crushed in alcohol, yield a drug called *digitalis* which for centuries has been used as a heart medicine. The reputation which *digitalis* had acquired was much exaggerated. No one drug could possibly cure all the conditions for which it was recommended. Mackenzie showed, however, that *digitalis* has one very powerful effect: it is a kind of sedative, and it acts upon those fibres winding round the heart which convey the electric impulse which signals to the ventricles that it is the moment for them to squeeze. *Digitalis* calms or quietens that impulse, and soothes the excitable heart beat. In doing so it stops the wild delirium of the upper chambers from running down into the ventricles. In this way it prevents, or arrests 'heart failure' and the circulation goes on.

Mackenzie gave *digitalis* the much higher status of a drug

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with a specific action. Quinine cures malaria. Opium dulls pain. *Digitalis* calms the heart and prevents 'heart failure'.

James Mackenzie's exploit of invading that dark country labelled 'heart disease' and tracing through it a definite pathway of cause and effect, was a big achievement. The correct use of a powerful drug *digitalis* which had been abused, or not fully used since the first apothecary picked the foxglove, is a magnificent addition to our slender resources of healing. But greater still is the method which he used to bring off these advances, because the method can be used to endow medical treatment with even more advantages. Mackenzie's attitude to his work has a moral grandeur that belongs to himself. He set out on his own original road, without tradition to guide him. He had no training in research, no assistants or laboratory, and he did not find his thought material in books or records. He moved face to face with the darkness, until gradually he was able to feel his way.

Such was Mackenzie's style of life, but it was not the only style.

6

THE YOUNG OSLER

The theme of this book is contrast, difference. Just as in chemistry the strength of an acid can be tested through measuring it against its opposite an alkali, so one medical personality can be estimated in terms of another who was strong in a different way. To the rugged James Mackenzie we shall oppose therefore the very great physician William Osler, who was very different. The aim is something more than merely an intriguing effect of comparison. The result must be to bring out the essential strength in each.

It is another world in which William Osler moved, a brighter and more scholarly world. We are away from the daily routine

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of general practice in an industrial city. Osler is a teacher, a born lecturer, admired by students, a frequenter of medical societies and clubs, a cosmopolitan, and above all, a friend of libraries. He moves from Montreal to Philadelphia, then settles in Baltimore, then in Oxford, and every medical congress in Europe knows his jocular and irrepressible fecundity of ideas. Such a life of variety was not adopted only when he became famous, but was policy and necessity for this gregarious man from his early years. Our contact with William Osler, through reading of his life, is more exhilarating than the bleak tale of James Mackenzie's working years.

A Cornish clergyman sailed for Canada in the year Queen Victoria came to the throne, and his ninth son, William Osler, was so sallow in complexion that the artist John Singer Sargent said he had never before had to paint a *green* man. Brought up in what was practically a frontier settlement of upper Canada, he had the good fortune to come under the influence of a remarkable man called James Bovell, who was a clergyman, doctor of medicine, natural philosopher and many other things beside. He fascinated the boy Osler, and still sixty years later he fascinated Osler the man. James Bovell implanted a love of books and love of the mystery of nature, and Osler acted throughout the rest of his life upon the manifold inspirations which his teacher placed there.

At eighteen Osler became a medical student, and when he qualified at McGill College, Montreal, four years later, he had the wisdom to refuse a lectureship, but enlarged his post-graduate experience by crossing the Atlantic and spending a few months in London which then offered incomparable opportunities of medical learning. Osler loved his microscope, and in these first months, the dawn of his professional day, he made his chief original scientific discovery, that of the 'blood platelets': these are elusive specks of tissue, exceedingly small, present in the circulating blood, their role being to lay the foundation for blood clotting when it becomes necessary. Finding the 'blood platelets' was not perhaps a spectacular event

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in medicine, but it revealed an exceptionally active mind, and a hand which had learned all that was to be known of the art of microscopic staining. But even the 'blood platelets' did not keep Osler in London. He returned to Montreal.

He was appointed lecturer in the 'institutes of Medicine', a comprehensive mixture of biology and physiology, with much microscopic work. In fact he practised scientific medicine long before that sport was a familiar exercise among physicians. A year later, Osler was made professor and, at his own expense, furnished twelve microscopes for the use of his students. He also acquired the habit of doing careful post-mortem examinations and writing summaries of what he found. He was indeed an untiring investigator of both the living and the dead. On one occasion this restless curiosity led the hunter of post-mortems into a perilous situation.

There was in Canada a famous living specimen, a sort of walking exhibit for a physiological museum. He was a half-breed, named Alexis St. Martin, who during the Frontier wars had been wounded in the abdomen in such a way that a permanent opening remained between the stomach and the outside air. The rest of the wound healed well and the possessor of this unusual aperture allowed himself to be used for harmless, but very interesting experiments. Meat was swallowed into the stomach and watched from the outside, so that the wonderful process of digestion, the pouring out of stomach juices, the gradual absorption of the food was observed directly and for the first time in history. Alexis St. Martin by this passive co-operation with his doctors is the begetter of modern knowledge of the physiology of digestion. Fifty-six years later, the patient Alexis, who had never refused to lend his stomach for the good of science, was known to be dying, and Osler was exceedingly anxious to make this historic organ a specimen in the U.S. Army Museum. But his scientific intentions became known to family-proud relatives who saw the matter in a different angle from that of Alexis, whose zeal for physiology had been lifelong. They guarded the dying man with rifles, and when at last the

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co-operative Alexis passed away, Osler received by telegram the laconic warning: 'Don't come for P.M. you will be killed.' He kept away and lived to tell the story.

After ten years as pathologist, clinician and general inspirer in Montreal, Osler was offered a chair of clinical medicine at Philadelphia; he tossed a coin and abided by its decision that he should accept. He was thirty-four when he settled first in the United States.

Life there followed the usual Oslerian course. Outside hospital he saw any patients who came to the door, but he always preferred his own more scientific pursuits, and never strove to build a practice. He was noted for flamboyant neckties and his habit of springing along the streets of Philadelphia in song, and he indulged in practical jokes and epigrammatic postcards. One of his patients was a massive old man with a flowing mane of white hair — the poet Walt Whitman, who was at the close of his long years.

Dr. Osler was not the man to fall into a rut and when the Johns Hopkins Medical School was opened at Baltimore he was called to be a professor of medicine. There can never have been anywhere a more brilliant team of men than those first teachers at Johns Hopkins: Halstead in Surgery, Welch the pathologist, Howard Kelly in diseases of women, all outstanding: yet William Osler was perhaps the most celebrated of them all.

Those following fifteen years at Baltimore consolidated his fame. In later life he took pride in the legend: 'Osler admitted students to the wards.' These were the days when teachers of medicine stood in the amphitheatre and delivered highly systematic lectures. But Osler believed in gathering his students around him, and around the patient's bed, and he would bring out the features of disease in brilliant descriptions and searching questions. Not only did he admit the students to his hospital wards, he admitted them to his whole life, his books, his addresses, his personal confidence, and every Saturday evening a group of interns would discuss cases over beer and pretzels, and then watch Osler take out the treasures from his book-

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shelves and talk of the great doctors Linacre, Harvey and Sydenham.

Osler was a great believer in keeping himself up to date by what he called his 'quinquennial brain dusting'. It meant a journey to Europe every five years, visiting clinics, libraries, talking to other physicians, passing through orthodox medical atmospheres like a whirlwind. Then at the age of forty-one he wrote the famous 'Textbook'.

Osler used to say that before forty life was fit for better things than textbooks. He even said that by forty a man's best work was done. Osler himself was, of course, an exception to his own too hasty and widely debated dictum which he subsequently regretted. When he sat down to write, he was drawing upon an experience of many types of cases, and enormous scientific reading. Osler was a synthesizer. He put together existing material, and gave it shape and coherence. His textbook was himself the teacher and inspirer, and it spoke with the voices of all who had given Osler his inspiration, beginning with James Bovell, that all-round savant of the early days, to whom the book was dedicated.

His house physician gives an amusing experience of the parturition of this book:

He asked me if I would loan him the use of my library for an hour or so in the mornings. I of course said 'Yes, with great pleasure'. The first morning he appeared with one book under his arm accompanied by his stenographer. When the morning's work was over, he left the book on my library desk, wide open with a marker in it. The next morning he brought two books with him, and so on for the next two weeks, so that the table and all the chairs and the sofa and the piano and even the floor was covered with open books. As a consequence I never was able to use the room for fully six months. Oftentimes right in the middle of his dictating he would stop and rush into my other room and ask me to match quarters with him, or we would engage



WILLIAM OSLER : PARTURIT OSLER NASCITUR LIBER

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in an exchange of yarns. It was a great treat for me, and except when he would court inspiration by kicking my waste-paper basket about the room, I thoroughly enjoyed his visits.

The illustration shows Osler in the house physician's room and the playful words underneath *Parturit Osler, Nascitur Liber* were written by himself to describe the gay childbirth which brought forth this lusty offspring.

During the composition of this 'scientific treatise made literature', as the book has been called, he put on eight pounds in weight, and realized by its success (23,000 of the first edition were sold) that he had committed himself to the bondage of a three-yearly revision. Textbooks are like prize blooms: in time, their glory fades, and newer blossoms become the fashion. The author of the textbook must be prepared to sow fresh seeds, prune and cultivate, if he is to keep reputation. Almost at once Osler's *Practice of Medicine* became the authority which carried students through their examinations, and helped mature practitioners to find some refreshing attitude towards an old disease. But its most fruitful and unpredictable consequence occurred out of a mere accident, when a copy of the book fell into the hands of a certain Baptist clergyman.

What did a Baptist Minister need with a textbook of medicine? This was not an ordinary Minister. He also happened to be the confidential adviser to Mr. J. D. Rockefeller, the richest man in the world, for whom he wrote reports upon charities, investments and men. The shrewd Minister was fascinated by the textbook, but he was specially impressed by one feature which probably escaped the average medical reader altogether. In its pages there was very little said about treatment and curing. Dr. Osler would write several pages about the *cause* of a particular disease, much about its history and diagnosis, but the cure he would often dismiss in a single line, because the cure did not exist. The confidential adviser read the thousand pages of this unusual work of medicine, and entertained himself on a railroad journey by making a list of the diseases where

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Osler stated there was no known remedy. Then he whispered in Mr. Rockefeller's ear that there was one way to cure the prevailing ignorance of means to cure disease, and that way was Research. The effect of this proposal was magnificent. Rockefeller's organizing mind seized the point and a great Foundation was created and handsomely endowed, and the Rockefeller Institute of Medical Research arose impressively on New York's East River. Great results have sprung from this institution, and it has inspired other Research gifts, so that organized disclosure of the secrets of medicine, in common with the endowment of churches and museums, has become a respectable object for private benevolence. All this goes back to Osler's textbook and his scepticism over the results of medical treatment. Osler's want of faith had moved a mountain.

Though chiefly interested in individual medicine, Osler knew that communal hygiene was equally vital, though less generally accepted. The medical practice of his day in America consisted largely of three diseases — typhoid, malaria and tuberculosis, all of them preventable. He pointed out, in forcible speech, the insanitary condition of Baltimore and other American cities, comparing their hygienic backwardness, due to corrupt administration, with the progress made in public health in some cities of Europe. 'We are doing, Mr. Mayor, not one solitary thing a modern civilized community should do . . . We want something new, something good, and just you frame a charter without any of the ancient tomfoolery,' said Osler in Baltimore, 1902, shaking a finger at his Worship, and to the medical profession he was never tired of pointing out that so-called 'Typho-malarial fever', a favourite diagnosis of the day, was a figment of the medical imagination. He advised his brethren that, when faced with a case of fever whose cause was uncertain, they should suspect Typhoid Fever north of the Mason-Dixon line, and to the south of the line Malaria should be considered. This Oslerian dictum tells us better than any statistics how much public hygiene was improved in the last half-century.

REGIUS PROFESSOR

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REGIUS PROFESSOR

By the beginning of this present century, Osler began to feel the strain of his quadruple life as consulting physician, medical teacher, reviser of the textbook, and general bibliophile. He even talked of retiring. In all his American years, after leaving Canada, he had never become a citizen of the United States: he was proud of his British origin and he was too much a lover of culture not to desire permanent contact with the older libraries and museums where lay the chief food for his imagination. In 1904, he was offered the Regius Chair of Medicine at Oxford. He accepted, and made his last migration, and the ancient University felt an irresistible force, particularly in its famous Bodleian library, of which Osler became one of the curators with ample scope for his bibliographic talent. There is an exciting tale of how he came on the scent of a First Folio of Shakespeare which had been removed from the Bodleian three hundred years before. Osler pursued it, found it, bid for it, collected money to buy it back, and finally returned it to the Bodleian, and now the priceless volume is on the shelf where it belongs.

Osler had an extraordinary social instinct, always creating, inspiring, and reforming Societies — for doctors, for bibliophiles, and those amalgams of profession and lay opinion that demand social reforms; and to have him on the committee was to admit a dynamic force. It gave him immense pleasure to rescue from the bookshops old editions of famous medical books, and he loved to make presents of them to libraries, or better still to a small group of enthusiasts. Osler would inspire one or two younger men with the idea of starting a medical club and library. With practical letters, and a cheque for the first subscription, he would discuss at length whether the club was to be named after Linacre or Harvey, and certainly he would attend the inaugural meeting and give a stimulating and jocular

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address. When the new society had been going a year, it would probably receive a further letter from Osler saying that the library must certainly possess Ambroise Paré's *Anatomie Universelle*, and he enclosed a copy which he had come across on a Paris bookstall. A year or two later when perhaps the secretary thought the founder had forgotten his offspring, a further Oslerian postcard was sure to arrive asking for news of the club, and adding that the library could not possibly be without a copy of Ambroise Paré's *Anatomie Universelle*, and as he had happened to find one in an old bookshop in Florence, he hoped the club would accept it as a gift. Generosity and inspiration were so native to his personality that he never remembered half his good works.

William Osler was by now the outstanding doctor of the English-speaking world, and he found his Boswell in Harvey Cushing's great biography, a treasury of his letters, postcards, anecdotes and opinions which flash with wit and humorous humanity. Such a man deserved an exceptional record, and this large-minded book has to be mentioned among the notable biographies, with Trevelyan's *Macaulay*, Sandberg's *Lincoln*, and even with Boswell's account of the sage who was probably not better known to the learned world in the eighteenth century than Osler at the beginning of the twentieth.

Healing the sick requires extraordinary psychical output and mean-spirited men seldom made a great success. Osler had every quality of the modern physician, he practised twentieth-century medicine before the end of the nineteenth, yet he had been educated in an age of miserable sick-houses, incompetent nursing, no clinical teaching, over-drugging, and no science. His youth was passed when theology was the final court of appeal in everything. He lived to see medicine accepted as one of the humanistic sciences.

In the last years, the Regius Professor at Oxford would be noticed during an overlong committee at the Bodleian scribbling on his agenda paper, a meditative look on his face. The idle hand was doodling in practised reiteration: JAMES BOVELL,

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JAMES BOVELL M.D., JAMES BOVELL. That fine schoolmaster, the brilliant Bovell, held Osler's imagination to the very end. *James Bovell, James Bovell*, he scribbled, and that name was written in his will spurring him on. Perhaps he was conscious of feeling inferior to his idol, though he spoke of Bovell's 'fatal fault of diffuseness'. Yet the old teacher's gifts lived inside himself, and with few exceptional men do we have such a frank acknowledgment of possession by the spirit of another.

At the age of seventy, tired but not defeated by the labours of ten men, though secretly demoralized by the loss, in the first great war, of his only son who would have succeeded to his baronetcy, Osler developed influenzal pneumonia. Even in this fatal illness he found moments to write clinical notes upon his own case, and compose a long list of gifts of favourite books to the British Museum, the Bodleian and other quiet places where he had been happy. He was not appalled by the thought of death any more than he was oppressed with the seriousness of life, and towards the end the sick man playfully shied a piece of lemon peel at his doctor. William Osler passed to the unknown destination with noble sang-froid.

What is to be said of Osler's great monument, the textbook? Like tombstones, such memorials fall into decay: or they pass into other hands, and are rewritten according to the whimsies of new editors. And perhaps we are passing into a time when the textbook itself will be outmoded, when in the age of loose-leaf books, microphotographs and cinema films, even Osler's *Practise of Medicine* will be a prehistoric megalith.

Sir William Osler's name is bigger than his textbook, and the legend grown about his personality is too young to fade. With his idol, Sir Thomas Browne the Caroline physician, with those three masters of English medicine, Linacre, Harvey and Sydenham, whose portraits hung in Osler's study, his repute will live on easy terms. In one of his addresses, Osler once classified great men into the *Creators*, the *transmutors* and the *transmitters*, saying that human progress owed most to the transmutors — those who adapt great ideas to the service of their generation.

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Osler's biographer, Harvey Cushing, adds that Osler himself belongs not to any of these, but to a fourth great type of humanity, namely the *animators*, or *inspirers*: those who stimulate others to create, who provide the tools, the situation, and often the very ideas, yet cannot of themselves strike the final spark of life.

Sir William Osler in his day was the great representative of traditionalism in medicine, and seldom has that outlook been so ably and sympathetically presented. It is a philosophy which makes appeal to the past, to great names and famous books, and it flowers in the formal oration and those volumes of essays presented to great men on their seventieth birthdays. It is a very cultured way of interpreting the progress of medicine.

But is there not danger in this historical outlook? It is true that to-day we do not burn our opponents at the stake as Calvin burned Miguel Servetus the man who discovered the pulmonary circulation. But there are ways of burning ideas without fire. May not the cult of the library and the lure of those rare first editions be more perilous to growth and progress than the fire that failed to destroy the ideas of Servetus? Gracious tradition and too much learning may be as harmful as intolerance. Here the general practitioner of Burnley speaks out, asserting dogmatically that the great discoverers of medicine always turned their backs on the previous age. It is necessary that the Past should not be allowed to crush us, and that once in a while we should make a bonfire of the dry wood of ancient knowledge. Mackenzie would say that it is more vital for the doctor to read his patient's face than to read all the books in a library.

This is where the contrast between Osler the traditionalist and Mackenzie the investigator illuminates so much of them both. Mackenzie's patient observation will show us how to revolutionize the healing art. Yet a touch of Osler's humanism will keep medicine sweet and enable us to be superior to the pessimism that nowadays steals over us when we shudder at the unlimited potentiality of Science for evil as well as for good.

This brilliant fellow Osler was at home in the world of

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Harvey, Sydenham and Linacre and other great names of medicine, and he understood their thoughts. He was able to teach and inspire others as he was inspired by James Bovell. He was a great doctor in part because of his high ethical ideal for the profession.

Yet all the while James Mackenzie, outwardly less stimulating, was himself living medical history. A lonely man, compared to Osler, he felt his own way towards laws that appeared in no ancient manuscript, yet which he felt instinctively were too deep for one man to discover.

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MACKENZIE MOVES TO HARLEY STREET

In contrast with Osler's full and sociable existence, the methodical labour of the Burnley general practitioner is like the report of a sociological experiment. We think, for a parallel, of the career of Jean Henri Fabre, called 'The Insects' Homer', who observed those lowly creatures — butterflies, cicadas and beetles — for half a century, and then described things which no one had ever seen before. James Mackenzie possessed that strong pristine vision. While Osler, examining a patient, looked for signs and symptoms already familiar in order to work a brilliant picture of disease, James Mackenzie was searching for what no medical eye had ever observed.

Many doctors stay in one place all their lives, though not for the austere motive which inspired James Mackenzie. Thousands of thoughtful practitioners might have made these discoveries, but James Mackenzie was unique and only he made them. 'Find a person with a particular symptom and observe what becomes of him. Then you will understand what that symptom means', he said. It was clinical book-keeping of a most rigorous

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kind: no dividends, no profits, no interim bonuses — no benefits until the end of the year, or rather, in Mackenzie's view, thirty years or more.

About the time when Osler crossed the Atlantic to make his final home in Oxford, James Mackenzie also took a leap into the professional dark. He had to put over his ideas, and English snobbery being what it was, he felt that no notice would be taken of a Lancashire G.P. His personal researches had now gone far enough for him to announce certain provisional conclusions on the cause of Heart Disease, and he felt the moment had come for him to quit general practice in Burnley and migrate to London. His mind was made up for him partly by a financial slump which had jeopardized his savings, but chiefly because he was ready to spread his gospel. It was a personal wrench for him to leave his old patients whom he understood to the bottom of their souls. They and their descendants in Lancashire speak still of his homely ways, his absent-minded habit of picking up uninvited a piece of ginger cake from the table, his interest in the home-brewing of beer and other interests of people's ordinary lives. Certainly Mackenzie did not give up general practice through lack of sympathy or want of success. He was becoming well known around Burnley and Dr. Graham Steel used to invite him to lecture to students at the Manchester Royal Infirmary. Foreign doctors were heard asking about him when they arrived in England, though established physicians at home might pretend never to have heard Mackenzie's name. William Osler, the exception to all rules, had scented him out and been Mackenzie's guest at Burnley, where the two men discussed heart problems. Sir Clifford Allbutt, afterwards Regius Professor of Medicine at Cambridge, had called Mackenzie 'an original seer of solid achievements at work in the Galilee of Burnley'. So that to the observant few, he was more than a name when he moved to London.

Mackenzie's *hegira* to Harley Street was an inwardly-inspired move revealing his self-confidence. When he went to London, he was virtually unknown to the profession at large; in a year's

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time, he was famous. The bridge from anonymity to medical renown was once more, as in Osler's case, a textbook.

James Mackenzie's book on *Diseases of the Heart* has none of the broad sweep of interest, the historical background and scholarly variety of Osler's book, but it is a faithful account of one man's work, a cautious and very provisional picture of heart diseases and raises more questions than it solves. It is a personal book, coolly communicating individual experience. After describing remedies he used for a certain condition, and the successful results, Mackenzie says modestly, 'I trust I am not so foolish as to fancy the recovery was due to my skill'. While Osler describes the imposing cavalcade of doctors winding their way through centuries of medical progress, Mackenzie is content with a dry analytical view of facts and theories, and a description of what he had found in his own practice. His book, however, was one which the practising doctor found useful, and the moment this was realized, James Mackenzie's reputation as a heart specialist was made.

A place was found for him on the teaching staff of that famous medical school, the London Hospital, where a special Heart Clinic was started with Mackenzie in charge. He was formally examined for Membership of the Royal College of Physicians, who are the consulting doctors of England, though Mackenzie himself described this test as 'a comedy', and later he was admitted a Fellow. He settled down in Harley Street, where the wise men of English medicine wait behind their dignified nameplates.

Now, after thirty years of experience, he had no need to use the smoked curves, the slow methods, the anxious calculations of prognosis. He could sum up cases instinctively, he read the whole language of the heart where another would understand only a few phrases, and to his consulting room flocked the distinguished invalids, the Statesmen with tired hearts, boys forbidden games, young men refused life insurance, and a whole retinue of pathetic creatures whose symptoms pointed to the circulation — real or imaginary heart invalids who had tested

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every spa on earth, nervous ones who had taken baths at Nauheim, and waters in Bohemia, a throng of tired, expectant and ready-to-be trustful people came there, and history says they went away satisfied. His consulting room itself was plain, his methods simple, and he made no great effort to please. To patients he seemed a gruff but courteous bearded man, who often answered their questions by some perplexing rejoinder, as when he said to one mother who asked what was the cause of her child's nose bleeding — *Why shouldn't it bleed?* That was perhaps a scientific attitude, but it was not the answer expected from the great specialist.

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THE WISE PHYSICIAN

Wherein lies the secret of that rare art of being a successful consulting physician? Firstly, in that indefinable but easily recognizable test that people clamour for his opinion. It is the confidence that makes a sick person willing to spend his last shilling, or travel a thousand miles just to possess. Of course, such unusual magnetism is not achieved without toil and experience, but personality is all important, since fundamentally, the art of being a consultant (in popular language 'a specialist') means giving the faculty of reassurance 'at the highest level': not merely to diagnose the illness, but to stimulate the patient's latent powers and bring out his utmost effort. Despite his lack of a honeyed answer to the hackneyed question, Mackenzie gave a magnificent sense of certitude to those who came to him.

James Mackenzie had no need to act any part; he was in his demeanour, his distinguished bearing, a man to whom other men looked in pain or difficulty. When a soldier's heart hospital was established in London during the first world war, he was offered sole command; but he preferred to have other col-

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leagues, he was free from petty jealousy or egotism. William Osler and Clifford Allbutt were appointed to share with him the responsibility and these three men, the greatest physicians in England, worked harmoniously together.

Mackenzie's fame spread quickly once he came to London, and as he was accepted, part of the medical world developed the belief that, of course, it had known the substance of his teaching long before. Among doctors, as in other callings, there is a type of armchair savant who, as new discoveries are announced, reaches the illusion that he has made them before, and basking in the fictitious originality of his own make-believe, turns on the true discoverer half amazed and spurns him as an impostor of no claim to fame. Many doctors told James Mackenzie that they had always known *digitalis* was good for the heart. Half humorously he came to the conclusion that there were three stages in the reception of a new fact in medicine. 'First, the critics say it is not true, then that it is of no importance, and finally it is not new.'

James Mackenzie's discoveries in heart disease have obscured the fame of another very significant find in clinical medicine. He was the first to prove that such internal organs as the liver and the stomach cannot feel pain — in themselves — but, as it were, arrange for pain actually to be felt elsewhere, usually in a particular belt of skin near at hand. This 'whipping boy' principle, by which one part of the tissues bears pain reflexly on behalf of another, is one of the great laws of medicine, and was found, almost casually, by Mackenzie. He was drawn to the study of certain automatic processes which go on in the body and which are called 'reflex actions'. As he grew older, he regarded 'reflex action' as the key to the enigma of medicine. Reflexes between the brain, the organs and the skin formed the normal machinery of the human body. Through 'reflex action', which is of course largely automatic and not under the control of the will, the system preserves integrity as a living organism. What then if disease were merely an exaggerated, or perverted 'reflex action'? Mackenzie reasoned.

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He was fond of the following simple illustration to describe his theory. A healthy man climbing a steep hill becomes out of breath, but not when he walks up a gently rising hill. That is normal functioning. But the patient with heart trouble becomes breathless even on walking up the gently rising hill. That is disease, an exaggeration of a certain automatic bodily process — the shortness of breath — which is normal at a higher level of effort. Such was the Mackenzie doctrine of 'diminishing reserve force'.

He made all his discoveries by training human senses — sight, touch, hearing, smell, and that mysterious intuition which binds them together, and he taught that the doctor's senses were to be educated to be more delicate, more precise than any instrument. His early apparatus for examining heart patients, the tambours, rubber tubes and smoked paper, were regarded as merely aids in training the doctor's own faculties, and he used such contrivances rarely in later years. Medical research was complete absorption in the patient's symptoms, his fears, worries, reticences, a state of mind in the doctor which is similar to his medium. He was fond of putting to students such artful and unanswerable questions as 'How do you tell a rose has scent?' He would not agree that any instrument for analysing an emanation from the flower could improve upon the human nose.

He tells the story of being asked by a practitioner to see a woman with puerperal fever following childbirth. The family doctor was very depressed and said: 'Too late', blaming himself for having allowed this condition to occur, but Mackenzie felt the pulse and mentally built up one of those indefinable impressions which are comparable to the images of a poet. His eye noted relief, tranquillity, the signs of abating fever as seen in the colour of the skin, the feel of the bounding pulse, the look, the attitude of the patient, and his experienced perceptions instantaneously fused them together. 'You'll live to have a dozen babies', he said, and the young mother justified his prognosis by making a good recovery. This was not merely bedside

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manner, or clever suggestion. Mackenzie had done nothing but read the signs in the patient's appearance, yet there he found all that was needful.

Another case followed. This time the patient's doctor was optimistic and had called in Mackenzie merely to reassure unduly anxious relatives. Again the great man felt the pulse and read the language of the features. 'That poor woman will be dead in twenty-four hours', he said, and so it came to pass. 'No blood count, no bacteriological examination, no instrumental method of examining the heart could tell me as much as a glance at the face and the feel of the pulse.' These contrasting episodes in the life of a consulting physician, as described by Sir James Mackenzie's own words, are not to be read as cocksure boasting, nor did he mean to encourage that habit of 'lightning diagnosis' which is a sure sign of quackery. His judgments were made half intuitively, and were the sum of countless previous observations, stored up in his clinical subconscious over years of patient watching by the bedside, and sympathy with human beings in need.

Many experienced doctors do the same, and this is the reason why some have very large practices compared with other equally conscientious men who are not gifted with these subtle means of apprehension or who have not striven to acquire them. But Mackenzie insisted that the method was a principle of medical education and it needed a man of his immense prestige, who had held his place at the London Hospital as securely as in Burnley, to declare bluntly that behind those new sciences which modern medicine employs, there is the irreducible science of clinical medicine to be created only out of human sensations.

At the height of his fame, Mackenzie did not always try to please the medical profession. His last book, *The Future of Medicine*, is a series of simple generalizations, and critics said the old man was failing, and that he ought not to have strayed from the province of diseases of the heart where he was unchallengeable to enter the province of philosophy where he was a novice.

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Yet the book reads well, even twenty years later, and this little volume stands for any medical student as the distillation of a sceptical man's faith.

Mackenzie also criticized his fellow doctors for keeping up the division into physicians and surgeons. In Burnley, of course, he himself had followed both callings, as to a lessening extent every general practitioner does to-day. Although a great army of specialists has grown up, yet the purely functional distinction between the doctor who devotes himself to precise diagnosis, and the doctor who has perfected his manual dexterity, tends to become narrower. Perhaps in time the wheel will have revolved completely, and Mackenzie's ideal of a unified calling will be fulfilled. Each age is the victim of its own conventions which appear eternal truths. As Sir Clifford Allbutt wrote quaintly: 'From Greece and mediaeval Italy we have to bring home the lesson that any division of medicine into medicine and surgery has its roots not in nature, but in clerical, feudal and humanistic conceits.'

No man can be equally strong in all branches of medicine, and some specialization will always be required: yet Mackenzie's principle of unity is one which medicine has to learn afresh in each generation.

IO

RESEARCH STRENUOUS

James Mackenzie was now 'at the top of the tree' with patients crowding his doorstep, and doctors clamouring for his help in baffling cases. He might have settled down to some further strenuous, materially rewarding years, enjoying his leadership in a very competitive calling. He had been knighted by the King, made a Fellow of the Royal Society, and he was fortunate in his family circle. What more could any physician or scientific

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man desire of life? Mackenzie had been happy also in Burnley, but this fact had not prevented his migrating to London when his work required it. Now he was to make a second leap in the dark, or such the world thought it.

At the summit of his success he decided to give it up. The motive for his unexpected move is to be found in Mackenzie's philosophy, or rather, in his character. The last few years had convinced him that big reputations, big fees, and big hospitals did not form the most propitious atmosphere for what he wished to discover and to teach. He was at odds with the medical profession on nearly everything which concerned the education of future doctors. In any calling an unsuccessful man criticizing his own colleagues is generally discounted, since it is taken for granted that his revolt is due to injured vanity. But Mackenzie was a leader whom no one could afford to overlook, and now he turned his back upon Harley Street, and went again into general practice.

In all London Medical Schools he saw young doctors brought up in what he thought was the wrong outlook. They were being taught to 'follow research', and sometimes this meant staying as far away as possible from sick patients. In clinics and hospitals embryo physicians were being forced into an educational groove which virtually kept them out of that general practice which Mackenzie considered the only real training ground for consultant physicians.

The deadening though successful routine of Harley Street never had been congenial to a man of his temperament. In that illustrious atmosphere he saw his patients once or twice only instead of being able to guide their lives. All the time he was giving forth accumulated experience, and the thrifty intellectual Scot in him felt the urge to create fresh knowledge instead of living off his mental capital. So at the end of the first world war, he left London, throwing to the winds his £8000 a year earned in consulting practice, and started for the old University city of St. Andrews on the east coast of Scotland, not far from his old home at Perth. In St. Andrews he founded the most

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original medical enterprise, perhaps the most interesting medical research idea of the first half of the century.

'I trust I have no exaggerated opinion of my ability to combat disease, and I am conscious of my helplessness when confronted with most diseases.' This sentence from one of Mackenzie's books embodies his mental attitude to the new departure. He gathered around him the doctors of the town and proceeded to inspire them with his own ideas. Mackenzie always sympathized with the general practitioner, and he never really cared to be labelled a 'heart specialist'. And now, in a large house by the sea, he began to teach observation and intimate appreciation of symptoms.

Ten or eleven experienced general practitioners and two University professors formed this clinical brotherhood around James Mackenzie, and began to view their patients with a new vision. The St. Andrews Institute of Clinical Research was not well endowed with money, but it possessed an idea, and for the present, it had a leader who possessed authority and the patient fanaticism of the genuine discoverer.

With uncompromising frankness, Mackenzie warned his collaborators that the road of medical progress was littered with derelict schemes, failures resulting from lack of a guiding aim. For thirty years he had been telling hospital physicians that they seldom had the chance to see human diseases in their early and most significant aspects. Signs of illness were there, he told them, but physicians were incapable of understanding. With this humbling but salutary confession, having swept the blackboard clean, he proceeded to inspire his hearers with a Socratic method towards the patient, alert observation, and cautious scepticism. Records were made in the confidence that in due course most of the ten thousand people in the town would come under observation. From days when they attended the children's clinic, throughout adult life, to old age, any symptom sufficiently serious to bring them to the doctor would be noted. Mackenzie's own idea of record keeping was to concentrate on a few common sensations such as pain, breathlessness, etc., and

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to follow them up in the same person over summer and winter, illness and health, for many years.

This, of course, required careful records, since information from a population of ten thousand inhabitants was no use unless it was preserved for ready comparison. Mackenzie had strong views on records, and, earlier in his career, had been asked to advise the Local Government Board on a form of record card suitable for the new Panel practitioners to enter up their patients' maladies. But the idea came to nothing. Mackenzie was not interested in 'diseases'; he was concerned with symptoms, those disturbed reflexes which, if neglected, would become established and in ten years time would really constitute 'disease' in the ordinary textbook sense of the word. He insisted that the vital signs of ill health were the patient's own sensations, and these were beyond a scientific instrument.

In the largest room of the Institute, and given no mark of distinction other than his own magnificent personality, Sir James Mackenzie sat among the doctors of St. Andrews, discussing symptoms and patients. Everyone joined in the effort to separate the genuine light from a will-o'-the-wisp. He did not try to dominate the discussion, for no one knew better than he that his own years of life were strictly limited, and he wished the Institute to acquire an inherent vitality for when he was gone, yet to any foreign visitor who joined in these conferences it was clear that James Mackenzie was the intellectual driving force. He did not himself practise but he would cheerfully see any patient recommended to him, and for a few short years was a legend in St. Andrews. Although he was the most famous as well as the most experienced physician present, Mackenzie showed good humour and extraordinary modesty in proposing an opinion. After giving a brilliant description of some complex of symptoms, he was capable of adding 'such is the somewhat coarse analysis of indefinable impressions'. In argument, he followed his intuition and was not a slave to consistency, being ready to admit on a Tuesday that Monday's judgment was all wrong. Equally, on Wednesday, he was prepared to

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criticize what he had accepted for truth on Tuesday, and would defend his new convictions vehemently. Yet underneath, he was unalterable as a piece of Perthshire granite.

He had formed in St. Andrews what to-day would be called a Health Centre, and since all the doctors practising in the town were members, and kept there the records of their patients in illness and health, it was obvious that, in time, there would be material for a complete survey of the physical health of the people of St. Andrews. The Institute was equipped with an X-ray department and biochemical rooms, but probably, in Mackenzie's eyes, the Child Welfare Clinic was more important than any laboratory. Anyone who is curious in the light of present day medical controversies to behold medicine carried out by a group of general practitioners inspired by a common philosophy should visit the James Mackenzie Institute of Clinical Research, as it was called after the creator had gone.

People have criticized the Institute because it was managed by average doctors who followed a normal routine among their patients, rather than by a salaried investigator devoting all his time to clinical research. This, of course, would have been contrary to the founder's fiercest convictions. He disliked the notion of 'Research' as an activity remote from the sick bed, but Mackenzie's estimate of the situation failed to make full allowance for an inexorable fact of medicine, that his own heart's action was impaired by long labours, and that no amount of organization could create clinical genius. There was only one James Mackenzie. With enthusiasm the little band of medical explorers continued towards the mountain. Some would be lost in mist and some would never return. It was certain that none of the pioneers would see the end of the research in St. Andrews. These were the conditions of their devotion: absence of personal glory except what was legitimately obtained through achievement: group discipline, and far-horizon view-points. Mackenzie had inspired these men to do what he had achieved on his own and it says everything for his personality that doctors of established positions were willing to follow him.

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For the last seven years, he struggled on, breathing his spirit into those admiring disciples, but each month his own power of work, even of walking, grew less; attacks of *Angina Pectoris*, that excruciatingly painful heart disease which he had diagnosed and treated in so many patients, became more frequent until at last he had to leave St. Andrews and be content to hear of its progress at second hand.

In 1926 that stout heart, which for fifteen years formed a striking object lesson in the Mackenzie law of 'diminishing reserve force', one day ceased to beat. No man with his power of drive could have undergone that fifty-year programme of achievement without paying the price in his bodily organs. Of course, he had always known his death must come suddenly. It might have been expected that the intimate march of such a malady in his own body would have obsessed the heart specialist. Yet he paid it little attention and, with majestic indifference, he left behind no clinical notes of those subtle sensations caused in himself by disease and which he would have sought so eagerly in one of his patients. But in his will appeared peremptory directions that his heart was to be examined after his death.

At post-mortem it was discovered as Mackenzie foresaw that one of the large arteries supplying the muscle of which the heart is made had become blocked and gradually ceased to function. It was a grim confirmation of the strain caused by seventy years of intense physical and mental effort. For the final ten years he had subdued his disease by a spirit of patient acquiescence, but in the end, one more distinguished doctor succumbed to the malady to which he devoted his professional life.

The pulsations of that valiant heart are felt still in the Clinical Research Institute at St. Andrews. Have results been achieved? What is there to show for James Mackenzie's faith? Such questions are natural, but the questioner would have received no comfort from the founder himself. He knew that original discovery in medicine is a tricky and devious process, and he would have said the fruits of research lay in the accumulation

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of facts on the health of those who consulted the doctors of the Institute, rather than in immediate additions to practical medicine. It is too soon yet to produce the results. In Research, we cannot count the cost in the spirit of an actuary.

II

OPPOSITE PROTOTYPES

Once more we return to the fascinating contrast between these great physicians, the Regius Professor and the General Practitioner, and attempt to measure their different gifts to the art of healing. Osler represents the tradition of books and memories, Mackenzie the wisdom of primordial creativeness, and his personal mystery is that with such an austere deliberate view of medicine he was able to inspire such devotion. Osler's Latin vivacity dazzles us, while Mackenzie's Celtic earnestness is chilling. In temperament they were opposites indeed. Osler cast a magic spell even more powerfully on younger men than on his own contemporaries, and he stands even to-day as the ideal of an Anglo-Saxon man of medicine, but perhaps he knew that he never reached as high as his idol the brilliant James Bovell. Mackenzie's scepticism and philosophic humanity are less magnetic. He never allowed his disciples to think that medicine was an easy pursuit, while Osler would not let them believe that medicine need be grim.

When we put aside the differing personalities of the two doctors and attempt to evaluate their attainments, it appears that James Mackenzie's contribution to medicine is the more original, though when we measure Sir William Osler's power of giving life to ideas, his world-wide influence, and his share in sowing the seed of an enterprise such as the Rockefeller Foundation, we realize the extraordinary vitality of this many-sided man. Perhaps if we analyse it deeply enough, Mackenzie's

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service to medicine is chiefly *aesthetic*. Although his methods were scientific, his real aim was artistic. He insisted upon personal impressions of the trained senses as the root of medicine, and above all, the discoveries flowing from the use of those methods make him a healer in the great tradition, whose life will live on in many healed lives.

William Osler taught out of the abundance of his knowledge of what medicine is. James Mackenzie taught from the passionate fullness of our medical ignorance. Or if this be too strong a paradox, we may say simply that Osler was proud of what medicine had achieved, while Mackenzie was haunted by what medicine has still to learn, and in the growth of the art of healing, both philosophies are needed.

PART FIVE

WILLIAM MACEWEN
AND THE STORY OF THE BRAIN

LISTER AND MACEWEN

MAN, the conqueror of the physical universe, is rather like a recently-elected president of the mortals. He has reached his position through a victorious evolutionary ascent, and now the whole of nature seems to have acknowledged him as overlord. Yet it is an uneasy, uncertain power that he holds, and one day some other aspiring member of the animal world may thrust him out of his place. When we consider the immense fertility of nature, and the innumerable species of living things, it does not seem in the least essential that *homo Sapiens* shall always be king of the castle.

Man, however, has one supreme advantage, his complex brain. This organ has lifted mankind to the primary level of creation and may keep him there, or even raise him higher, to an unknown and unforeseeable place. The study of the brain should be one of the chief objects of human wisdom.

Hear what Hippocrates, the Greek physician of the Isle of Cos, said about 400 years B.C. 'Men ought to know that from the brain and from the brain only arise our pleasures, laughter and jests, as well as our sorrows, pains, griefs and tears.'

Yet it has taken two thousand years even to begin this profound and fundamental study. The two subjects of this chapter, William Macewen and Victor Horsley, are like Gog and Magog watching over the early growth of this brain science. Both made fine discoveries, the basis of future and even greater discoveries. They were giant men, as somehow befits the object of their study, and their lives make an interesting story from the human standpoint, because their temperaments were as opposite as their aims were convergent.

Both of these men experimented on the physical brain, nerve cells, nerve fibres. Neither of them had much interest in the

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behaviour of the mind, as an abstract entity, or the new psychology. They were practical scientists rather than philosophers, and they lived in an age when Soul and Spirit were at a discount in medicine, and nerves and cells were thought to be all a doctor need understand.

There is perpetual antagonism between brain and spirit, and it seems impossible that one man can make discoveries in both spheres. So the fashion of Research seems to alternate, now an advance along the straight nervous pathway, now a plunge into the depths of spiritual psychology. William Macewen and Victor Horsley represent the physical side. When they began their work, the human brain was a mystery. No one had ever more than a glimpse of the outside of its living surface. It was believed that merely to touch the brain would cause death. Besides, the organ was next to inaccessible, safe inside the bony box of a skull covered with hair, a very remote, well protected structure. But Macewen and Horsley touched, handled and even removed parts of it, and gradually, during their working lives, the physical mystery lessened, only to be succeeded by an even deeper mystery of the connection between this three pounds weight of semi-solid nerve tissue inside the skull and the Mind which so obviously dwells there.

A Scotsman and an Englishman, almost specially created for some museum of national characters, Macewen and Horsley worked in very different ways. The one very cautious and self-sufficient, labouring alone in his laboratory, and choosing to have around him men who were not collaborators, but agents of his will — Macewen methodically annexed half a dozen sides of medicine, put up his flag there and made them his own, and brain surgery is but one of his conquests; while Horsley worked gregariously, loved exchanging ideas, was innocent of personal ambition, yet was a man full of generous cranks and whimsies. They differed as much as any of Adam's progeny. Knowing them personally, one might have said they had nothing in common. Yet their contributions to the surgery of the central nervous system make up a perfect

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whole. Let us look first at the immensely dignified and grave William Macewen.

To see him in perspective we have to go back to one of the early tracks leading toward the modern high road of surgery. It is dirty, thriving Glasgow of the 1860s, just awaking to the need to make its medical school as worthy of the city as its ship-yards. The serious-minded Joseph Lister of Edinburgh has just been made University Professor of Surgery. That grim activity, not much humanized since the seventeenth century except that chloroform is used as an anaesthetic instead of unlimited alcohol, is carried on by Lister in the old Royal Infirmary, built actually upon the decays of a burial acre which went out of use only when no more corpses could be crowded there. Lister the Quaker, English by birth is, in the eyes of the orthodox Glasgow faculty, a man of peculiar views much given to messing with varieties of pastes and plasters in the treatment of wounds. As a religious gentleman he commands respect, but as a surgeon, they rather ignore him, and after a few years, he returns to Edinburgh. Among Lister's students during the end of the Glasgow period was the very tall lad from the Isle of Bute down the water by boat from Glasgow, then undreaming of its future holiday fame. There Macewen spent his boyhood half on a farm and half on a fishing boat. Even as an old man, people said he reminded them of a Viking out of an Icelandic Saga, and as a youth he must have been handsome indeed. There was no doctor in the Macewen family. His father was not a great worldly success and, during his son's boyhood, made his living as a skipper of a small steamer which had the honourable function of conveying ministers to and fro between Glasgow and their remote parishes in the Hebrides.

Macewen was not even a very intellectual boy but passed his time on sport and natural history. When he saw Lister working in the Royal Infirmary, his adolescent soul suddenly awakened. Macewen passed through Conversion. He realized the significance of Professor Lister's dabbling with carbolic acid as applied to wounds. Other students looked on carbolic as a sort

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of magic charm. They believed that it possessed a specific healing function. But Macewen divined that the carbolic was effective in healing the wound only because it killed the microbes.

Macewen follows Lister devotedly around those evil smelling wards, seeing that behind those crude experiments there lay a general idea. He practises the Listerian method on his own patients and is beginning to see improved results, when the teacher leaves for Edinburgh, and Macewen is intellectually an orphan.

A different sort of worshipper would have followed his master, to be near the source of his inspiration as in later years Lister's house surgeons followed him to London. But Macewen was not that kind of admirer, and perhaps at heart he felt he had learned all that Joseph Lister had to teach. The antiseptic doctrine had the saving simplicity that when once grasped, it could be advanced only in carrying it out. Macewen knew that he had the kernel of the theory, and his enormous self-reliance told him that he possessed the power of making Listerism vitalize the whole of surgery. So far, the method had not been published to the world; it was merely a creative idea, and Macewen felt confident of his own ability to bring it down to a set of everyday rules that would make surgery safer. So in Glasgow he remained, both to qualify in medicine, and to hold the fort for Listerism.

To the end of Macewen's life those student years under Lister were his golden age. That solemn Quaker who taught him surgery was the only man in the whole of his life whom he acknowledged as greater than himself. Later on, when as Sir William Macewen he was known over the whole world, he would recall in reverential reminiscence all that 'Mr. Lister' said and did in the old Infirmary.

Lister's original device for killing germs in the neighbourhood of an operation was a cumbersome apparatus rather like a blow-lamp which sprayed carbolic vapour into the air. An assistant was there to direct the spray, but inevitably it moistened the



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skin of the patient and the skin of the operator, killing off the delicate tissues of the body as well as the microbes. Lister was moving to a further phase of his practice rendering the spray unnecessary because everything in contact with the wound — instruments, thread, towels had been rendered germ-free by sterilization beforehand.

Macewen carried on experiments, trying out new materials like sheep gut for ligatures to tie up bleeding vessels, and fresh forms of surgical drains and dressings. His example was causing others to inquire about germs. Even the managers had become nervous about the site of their Infirmary of healing. The horrible discovery was made that a few feet below the wards where Lister worked lay the remains of five thousand corpses. Yet in these same wards, compound fractures and septic wounds were being treated successfully, in spite of the nearness of putrefaction below the floor, because Listerism had eliminated the germs. Yet in spite of the striking confirmation which the discovery of the graveyard gave to Listerism, Macewen working in these wards had the greatest difficulty in obtaining a suitable vessel in which to sterilize his dressings. He had to pay out of his own pocket for an instrument cupboard, and unknown to him until years later, some admiring nurses subscribed secretly and bought a fish kettle for Macewen to boil his forceps. He was now carrying into practice the creative truth of Listerism that a wound will heal through the inherent power of the body tissues, provided germs can be kept at a distance. Upon that idea, a sort of highly refined cleanliness, which to-day appears so self-evident, the whole of modern surgery had still to be built up. Macewen saw what the possibilities were and determined to fit himself to follow them. Two hospitals had him as house surgeon and then he found a job with the Glasgow Police Force. Each divisional police station had its medical officer on call for such routine work as examining clients of justice who were suspected of being drunk. It was like Macewen to make this sordid routine an opportunity for medical research. His police work has gained a permanent place in medicine. He found that there

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is a slight difference in the pupil of the eye between a man who is drunk and a man with a serious head injury, and this distinction is of first class importance in diagnosing between the two. The tragedy of a mistake, with the result of keeping a man all night in the cells when he ought to be in hospital, was more likely to be avoided if the surgeon paid heed to this minute physical sign which he discovered and which is now known as 'Macewen's pupil'.

To this unusual research into medical criminology there was a lighter side. In the interval between cases, and as recreation after the dreary round of 'charging and detaining', the constables practised fencing, and soon discovered that Mr. Macewen could make good use of his exceptionally lengthy sword arm. Other people were to find later on that in medical controversy Macewen possessed the same characteristic.

So a few years passed before William Macewen was ready to start in independent practice as a surgeon. The enterprise of making a start in the 1870s was formidable enough: a man of Macewen's outlook beginning surgery was rather in the position of a sailor in the time of Queen Elizabeth. The whole world was open to him and most of it quite unexplored. He had only to use his compass boldly, and sharpen his judgment with danger, and he might discover continents. A man like Macewen, one of the few armed with the new methods of antiseptic surgery, faced the exciting certainty that a whole world of new operations lay before him.

To-day, the young surgeon beginning his career may be compared more to the captain of an air liner who faces danger enough, but who can at least rely on instruments and his weather reports. The air captain has a much bigger technical problem than Drake, but he can reduce the unknown to manageable proportions, and he has the great moral reassurance that others have done the trip hundreds of times before. Macewen lived surgically in the spirit of Drake.

It was the epoch of the self-reliant pioneer. Many operations of surgery which are now taken for granted and performed every

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day by junior surgeons, were anxious adventures for William Macewen. He settled down in that monumental way of his, building up a very personal technique, a mental composure in the face of danger and crisis which never deserted him. Although risks had to be taken, it was never without calculation beforehand.

Such a bracing atmosphere entirely suited William Macewen, who was the most untraditional man alive. Self trust, self help, and marked scepticism towards other peoples' ideas, these were his leading qualities. Professionally speaking, he was something of a pirate. Sprung from a line of Norsemen who found new coasts to conquer, he seemed never content unless he was wrestling with a really hazardous problem in surgery, and he despised both the secondary and the second-rate.

First of all, the new surgery needed new instruments. Macewen threw away the old knives and bistouries, those elegant ivory-handled works of craftsmanship chased and carved with flowing designs. Such picturesque survivals were not only superseded, they were dangerous, since they could never be properly cleaned, and the crevices of handsome curves harboured germs. Macewen had new instruments created, in special steels, beautifully tempered, handsome in their austere lines, and with smooth surfaces that could be sterilized easily. His chisels made for use in the bonecutting operation called osteotomy reveal a fitness of material and understanding of their intended purpose that was rare among surgical craftsmen. William Macewen among other intuitions seemed to have grasped and applied surgically the teaching of William Morris that the most beautiful tool was that most finely adapted to its proper purpose.

Next to instruments, the prime need of surgery is for reliable thread to tie up bleeding blood vessels. When Joseph Lister began practice, fine strands of hemp were still in use as they had been for two or three hundred years, and after patiently exploring all possible alternatives, Lister had decided on 'cat-gut'. This is really a fibre from the intestine of the sheep, and

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is also used for 'cello strings'. But cat-gut is difficult to sterilize, and germs of tetanus, derived from the sheep's entrails, may remain inside the strands, and are liable to infect the wound in which the cat-gut is used. To prevent this, Lister had soaked his cat-gut in carbolic, but Macewen now carried the safety process a stage further. He steeped his raw strands of gut in chromic acid. This not only sterilized the material, but subjected it to a kind of tanning process so that it would last longer before absorption by the tissue where it was used to tie up an artery.

For forty years in all his operations Macewen used this 'chromic gut' made after his own prescription and under his own supervision. He put no trust in commercially prepared material. Such personal care over fundamental detail was typical of all his surgical technique.

He had an operating table designed by himself and made to his own requirements. In every detail of preparation, instruments, cat-gut, operating table, Macewen worked out his own ideas. For him, the actual operation was only part of a long series of steps which began in his laboratory, where, usually at night, he experimented with methods and materials until his technique was as perfect as it could be made. The patient who saw only that very commanding person who stood beside the bed could have no conception of the extent to which Dr. Macewen's enormous self-confidence depended on hours of practice beforehand.

Before coming to Macewen's most famous work, that on the surgery of the brain, we ought to explore the means by which he reached that organ, which is, of course, accessible only by making a hole in the bony box of the skull. The safety of brain surgery is dependent in no small degree upon the surgery of bone and this was Macewen's first interest.

Human bones consist of a hard outside layer and a soft inside, the 'bone marrow'. Apart from fractures, the chief bone disease which Macewen had to treat in the Royal Infirmary of Glasgow seventy years ago was rickets. Lack of sunshine, lack

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of food, lack of exercise had caused the legs of many a Glasgow slum child to bend during growth and become fixed in the ungainly deformity called 'bow-legs'. Others suffered the converse malformation of 'knock-knee', and once the child was fully grown, the bones had hardened, and no amount of sunshine or vitamins could put those rickety bones straight. The twisted limbs were there, and short of breaking them, there was no remedy.

Macewen's method of dealing with such a condition was, like all his other surgical inspirations, founded on natural principles. He argued as a forester would when faced with the problem of how to straighten a bent tree. Suppose a triangular wedge were removed from the outer curve of the bend, and the tree trunk then straightened and left to grow of itself? Would not that be, in theory, the perfect solution? It was in fact just what Macewen succeeded in doing upon the knock-knees and bow-legs.

Applying this idea to a rickety bone was not quite so easy. To begin with, removing the actual wedge of bone meant chiselling through the hard outer layer and opening up the soft bone marrow, and in that procedure, despite all the operator's care, septic microbes were likely to be introduced and spread up the hollow shaft of the bone, producing a dangerous inflammation which might cost the patient his limb. Thus the attempted cure of 'bow legs' might end in disaster. It was here that Macewen's peculiar patience solved the problem. His osteotomes, those perfectly proportioned chisels specially invented for the operation, chipped away just the right-sized wedge of bone. His Listerian methods prevented the entrance of germs, and his wonderful hands and good judgment did the rest. In Macewen's words, the cure of rickety deformities became commonplace and safe. By the year 1884, he had performed 1800 such operations, without a single death due to infection, and soon, all other surgeons all over the world were imitating him.

The irony of it is that to-day such operations are rarely

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needed, not because of anything Macewen did, but because rickets has practically disappeared owing to the care taken to give children a good diet, exercise and sunshine. But Macewen's dexterity acquired in opening bones prepared him for access to the brain.

How much had been discovered about the behaviour of the brain since the days of Hippocrates in the fourth century B.C.? Very little indeed.

2

EARLY BRAIN KNOWLEDGE

Franz Gall, whose theories had so much interested John Elliotson at the beginning of last century, believed that various mental faculties — humour, force, acquisitiveness and so on — were located in particular parts of the brain, and it was Gall who originated the idea of 'bumps' on the skull corresponding with enlargements of the brain underneath. This Franz Gall, a travelling philosopher, who gave off ideas like blackberries, moved to and fro between Vienna, Paris and Strasbourg at the end of the Age of Reason. At one time he was not allowed to lecture in imperial Vienna because of the subversive nature of his views, and amid much that was absurd and chimerical in his work, his notions of brain function became a basis for others to build upon. A swelling, of course, meant development of a special faculty. This was called 'Phrenology' or mind-science, but it survives to-day only in a very debased form as when the 'Professor' reads one's whole character from the outline of the skull. No one takes Gall seriously as a scientist, but at least his theorizing had one effect on the development of our knowledge of the physical brain.

A later pioneer in brain observation, Sir Henry Head, whose surname is appropriate for the great discoveries he has made, has written about the discoverer of phrenology: 'We think of

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Gall with derision, as a quack who was responsible for phrenology and bumps on the head. But it is to this man that we are really indebted for the beginning of the conceptions we now hold of the relations of the various portions of the nervous system to one another.'

Until Gall's time it had been the fashion to attribute the important mental functions to a pair of hollow cavities lying in the centre of each half of the brain. These cavities contain fluid, which before Gall's time was believed to be the true 'vital spirits', and responsible for the power of thought. But Gall transferred attention to the outside surface of the brain, to the layer of nerve cells called 'the grey matter', and this, he asserted, was the seat of all human talents, instincts and moral faculties.

In this layer of 'grey matter' on the outside of the brain he attempted to locate different 'organs' or, as we should now say, 'centres'. Thus he asserted that memory for names and places was situated at the front of the brain, of course on the surface.

Gall's leading disciple in France was a physician named Bouillard, Professor of Medicine in the University of Paris, who believed every word that Gall had written. Bouillard offered a prize to any physician who should produce an actual case to prove that the centre of speech was located on the surface of the front lobe of the brain where Gall declared it to be. No one came forward until early in the 1860s when Paul Broca, Professor of Surgery, met with a patient suffering from aphasia, or loss of the power to speak. His tongue, his larynx and all the organs required to articulate words were perfectly healthy. But he could utter no words because the trouble was in the brain. It was not so much an interference with the mechanism of speaking the words as with the mental power to choose the right words. Slowly the poor fellow's disease gained ground; the process, whatever it was, which prevented his forming words spread to other parts of the brain in a progressive degeneration, and he died. At a post-mortem examination it was found that the diseased process had started on the surface

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of the left lobe, in a particular situation afterwards called Broca's 'centre of speech'. It seemed, after all, that Gall's guess was correct. There was indeed a centre in the brain which presided over the power of speech, and it was located in a particular place where Broca had actually found it. And if a centre for speech, why not other centres? Broca's observation is really the beginning of modern brain localization. By using Broca's centre as a starting-point for journeys over the unmapped desert of the brain, it was hoped that other faculties, and even the secret hiding place of the intellect might be discovered.

So far, it has to be remembered, no surgeon had ever attempted to operate upon the living human brain. Broca's observations were made from the dead body only. The story now comes back to William Macewen in the Royal Infirmary, Glasgow, where one day a boy of eleven was brought in with symptoms suggesting an abscess pressing on the brain surface just behind the 'speech' centre, and Macewen, confident in his judgment, asked permission of the boy's mother to operate; permission was refused.

One cannot help taking a deep breath as we read of these pioneer operations, thinking of the anxious problem facing the surgeon. He is sure he is right. The boy has an abscess near the surface of the brain, and to operate and drain the matter from that abscess is the only hope. Yet such a thing is new, unheard of. No one has ever carried out such a procedure before, and in 1879 the public fears hospitals and dreads operations.

By our law no one may practise on animals to gain surgical skill. Macewen had to come to that boy's case unprepared, save by his intense studies of animal pathology. It is full of irony that just before this creative burst of discovery when Macewen's work began, Parliament should have passed the Act making it criminal to gain manual skill by operating upon animals, and that is still the law to-day.

In this case of the boy with the brain abscess, other doctors

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did not support Macewen's diagnosis, and he was considered an over bold young man, too ready with the knife. The boy died, but a post-mortem examination was allowed, and there, justifying Macewen's prescient deduction from the boy's symptoms, was the abscess, lying just behind the speech area of the brain surface as he had foretold. Other similar cases followed over the next few years and successful operations were done to remove various kinds of pressure inside the skull. Perhaps the only person not surprised by these satisfactory results was Macewen himself. To him, brain operations were logical consequences of certain strategic knowledge of nervous paths which had been coming to light for a decade since Broca's discovery. Diagnosis had to be exact since a matter of a few millimetres in localizing the probable site of the pressure made the difference between success and failure. When Macewen began his brain work, knowledge was theoretical and an exceptionally bold and dextrous operator was needed to put such ingenuities to the test. Surgeons as a whole were still afraid of the brain. It needed someone to make the first courageous stroke, not only in one case, but in a careful series of operations, and here Macewen's great surgical ingenuity and his self-preparation in a modern technique enabled him to turn the corner to success.

Surgery is the most pragmatic of all the sciences since the patient judges only by the result which is achieved. Macewen's results were good because of his command over his operating methods and more than anywhere else in the body, brain operations require a perfect technique. Macewen said brain surgery required the same delicacy one would use in working upon cobwebs, handling them, sewing them together, then unsewing them again.

But to reach the fragile brain one had first to prise open the box of the skull. This is done through a hinged door made in the side of the head. Macewen's experience with bones enabled him to treat the skull with confidence. Circular saws called trephines for removing small plates of bone had been used for two hundred and more years, but Macewen improved them.

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Even when the skull was broached, previous surgeons had been nervous about penetrating the next covering, a tough membrane as thick as heavy brown paper, which guards the brain. Once it was severed, there lay the organ of thought, a pinkish, white and smooth surface indented by curving grooves, and covered by a network of pulsating arteries and veins, branching like ivy on a wall. When it came to handling this highly-organized tissue of nerve cells and fibres, it was found that the surgeon could use the same methods as used elsewhere, if his hand be trained to the cobweb degree of deftness. The brain, bleeds, reacts, inflames and heals in the same way as other parts of the body, though the risks of bleeding are much greater in the brain and the dangers of infection with microbes even more critical. The essentials of brain surgery do not differ from the principles of general surgery. But their execution calls for unimaginable care and patience. The slightest manual roughness may damage the delicate surface.

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MAPPING THE BRAIN

Macewen went his own majestic way in the Glasgow Royal Infirmary, operating upon any brain case that came into his ward, building up by cautious steps that extraordinary technique and judgment that never faltered. He was primarily a general surgeon and the brain was only one of his many interests. Macewen was pragmatical, making use of his everyday opportunities, and not engaging in research for its own sake. His investigations arose naturally out of his daily work, and he was, above all, a great surgical artist, and long before the age of forty had become accepted as one of the stimulating teachers in the medical school.

It is the theme of this book that the way to progress in medicine lies through different temperaments, and while

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acknowledging that Macewen was the pioneer of brain surgery, we must move to London where two remarkable men were working on the physiology of the Nervous System.

Later on, this new spring of knowledge was to join with the main stream of which Macewen was the head water, but in the beginning they were far apart. The major prophet of the London School was Victor Horsley, born in a country house in Kent, belonging to a family of artists and musicians. On the surface, he was altogether a much more varied and human person than the lonely autocrat of the Glasgow Royal Infirmary, but beneath the surface Horsley's life was dominated by two passions: a great thirst for knowledge of the processes of life, and an imperious desire that habits, ideas, customs and above all British laws should undergo a revolution based on that new knowledge. To give illustrations of these two monomanias of Horsley's: it was quite like him to keep a roomful of patients waiting in his consulting rooms in Cavendish Square while he examined the brain of a walrus just died at the Zoo. To him, Science was eternal, whereas the claims of human convenience were inconceivably small. And to show how he aimed to alter human behaviour to conform with the teachings of physiology, we must explain that he was a lifelong abstainer from alcohol, and when a foreign scientist made him a present of a case of liqueurs carefully chosen and alluringly luxurious, Victor Horsley burned the lot. Yet lest these two incidents give an impression that he was a superman, lacking human feeling, we must record that he was idolized by patients, friends and pupils. Few men aroused more antagonism for their theories about life, and more love for their personal qualities. A fellow surgeon and close friend, C. J. Bond, writes of him in this period: 'New calls upon his time and energy seemed to act as stimulants to further effort. Brimful of kindness and enthusiasm for new knowledge, he shed abroad among fellow workers the glow of his personality. In the heyday of youth and vigour, never tired, and apparently untireable, he was then as in later days ever eager for the fray.'

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Victor Horsley began working on the brain when in his twenties. He was ambidextrous, could sleep at will for ten minutes at a time, and was liable to go on working in his laboratory all night. He used dogs and monkeys, carefully anaesthetizing them, and making experiments with the full Listerian technique. Horsley's first aim was to map out the functional areas of the brain. It was still largely a mysterious organ, although it was by now, following Broca's discovery, generally understood that the outside surface, the cortex, was where both feeling is understood and action begins. This outer surface contained specialized cells, some of them adapted to originate muscle movements, and others specially adapted to receiving crude sensations — the feeling of pain, heat and cold — and translating them into awareness of what is going on around us. Victor Horsley used a new technique recently invented by German scientists. This was nothing but a very delicate electrical current, applied carefully, millimetre by millimetre, to different parts of the brain *cortex*. By watching the bodily muscle movements at the moment when each separate area was stimulated by the current, a chart was made showing the connections belonging to each part of the surface. Thus one area of a few millimetres of cortex controls the movements of the head, another the arm, another the leg, and the same is true of sensation from various parts of the body. Broca's so-called 'speech centre' was only one of the many headquarters which are located on this wonderfully active, highly organized and specialized outside of the brain. Gall's vision and Bouillard's dream were being fulfilled.

When Horsley began his work, the plan of the human brain may be compared to the ancient *Mappa Mundi* of 1314 seen in Hereford Cathedral. The continents are in grotesque outline and most of the world's countries are blank spaces. When, Horsley finished, the map of the brain was more like an Admiralty chart. Yet the more he discovered about the function of the cortex, the deeper seemed the surrounding darkness. When all the centres of movement and sensation had been plotted out

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on the chimpanzee (and the human brain corresponds in a remarkable way), it was found that a large area of the brain cortex seems to have no specialized function at all. It is not connected with movement or feeling, nor with any of the bodily organs. It is blank. The name given to this portion of the cortex, which is much the greatest in extent, is the 'silent area', and since it is inconceivable that an organ of the body can have no reason for its existence, it is considered that the 'silent' areas are the home of thought. They are, in fact, the places where we reason, feel and dream, where we create and make plans to control our existence. The silent areas of the brain cortex are much more extensive of course in man than in animals, and they hold the secret of human supremacy, and the hope of its permanence.

Of course, Victor Horsley did not discover all this. The map of the brain cortex was completed by many hands, but he was the leader, the inspirer. Never was there a more generous master. Young men worked under him, carried out all his suggestions, and when their joint scientific papers came to be published, Victor Horsley would cross out his own name at the top and leave as the sole author some flattered helper who alone by himself could have achieved little.

The working of the brain and central nervous system was beginning to penetrate and influence medicine as well as surgery. The nerve fibres which issue from the cortex and pass like telephone wires through a complex series of exchanges, substations and junctions were now traced with accuracy, and the meaning of many nervous disorders suddenly became clear. 'Paralysis', for instance, was shown to be composed of a number of different varieties due to various causes, and many other diseases and symptoms could be explained in a more rational way. Passing on this expanding knowledge to sick patients and using it in treatment required a new kind of medical specialist. He sprang into being, and was called, and still is called, a Neurologist.

Over a corner house in Manchester Square, London, is a

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plaque to commemorate the Patron Saint of British Neurologists who saw his nerve patients there for many years. He was John Hughlings Jackson, and his work forms the third main stream in the great river of brain knowledge. He is the second of the two English leaders in this department, though from an intellectual point of view some people might place him higher even than Horsley.

This bearded sage, Hughlings Jackson, is in the tradition of the great English eccentric geniuses. His ambition was to develop a philosophy of nervous disease and to correlate the discoveries of other men which were just then dropping out of scientific periodicals like ripe apples off a tree. Jackson classified the functions of the brain. He divided them into the lowest or most primitive, leading up to the highest, where there is the greatest control by the will, and he showed that, in disease, it is these higher functions of intellectual thought and will-power that first go wrong.

Yet Jackson would not admit that body and mind could have any action in common, and indeed he called such a notion 'scientific blasphemy', and would have been entirely out of sympathy with modern theories which tend to mix up states of feeling and states of action, and to regard body and mind as only the two sides of the same thing. To Hughlings Jackson, body and mind were parallel — like a pair of railway lines, but not the same, though they might be leading in the same direction.

Hughlings Jackson was a man of endless foibles. He was extremely fearful of being bored, and would leave a theatre after the second act, and would rush away from the dinner table to read by the fire and avoid conversation. He would buy a book, cut it in half and put one section into each pocket. His thoughts were wrapped up in disease of the nervous mechanism. Yet he had a shrewd insight into the human mind too, as is shown by his unbeatable definition of the string of oaths. He calls it: 'A commentary of the emotions on the propositions of the intellect. Vulgar people insert an oath as a kind of detonat-

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ing comma to render forcible statements that might otherwise strike their hearers as commonplace.'

Hughlings Jackson is the philosopher of the nervous system, and he represents the use of abstract reasoning in brain diagnosis. Presented with a set of symptoms in a patient — headache or paralysis perhaps, he would, by careful examination, deduce that something must be pressing on nerve fibres in a particular section of the brain. He could locate it to within tenths of an inch, purely by a process of mental calculation. In diagnosis, he was a kind of armchair detective who can predict where the crime took place merely through analysing the evidence.

This increasing knowledge, represented by men such as Hughlings Jackson, opened up a still further world — the discovery of brain tumours, that is, new growths of nerve tissue which press on the brain.

Credit for the first brain tumour operation belongs neither to Macewen nor to Horsley. A young farmer of twenty-five had symptoms pointing to a growth on the surface of the brain, and eventually his condition became so serious that some kind of relief was urgently desired by the patient. A certain Dr. Hughes Bennett, a London physician and son of a professor at Edinburgh, remembered having years before suspected the presence of a brain tumour in his own father, and this idea had been confirmed at a post-mortem examination. Young Dr. Hughes Bennett had carried that picture in his mind for years, and now in the case of his patient, this farmer, he saw in life what he had diagnosed too late in his own father's case.

A rising surgeon, Mr. Rickman Godlee, a nephew of Lord Lister, offered to perform the operation and Hughlings Jackson and Lord Lister himself were present watching the carbolic spray hissing out antiseptic solution over the field of operation. Hughes Bennett's forecast was correct; a tumour the size of a walnut was found and presently removed. In that sense it was a successful operation, but in 1884 surgical methods for controlling microbic infection were still far from perfect, and the patient died, not from the effects of the brain tumour, but from

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the complications unavoidably introduced from the outside. The operation proved that mere removal of a tumour was only half the way to cure, because opening the skull was a risky procedure on account of those microbes whose very existence was still not accepted by the majority of London surgeons.

Strictly, this is the first recorded operation for brain tumour, but it came several years after William Macewen, working in his Glasgow Royal Infirmary, had successfully opened and closed the human skull for other conditions.

For the time Macewen's work and his claim to priority were overlooked. Gradually, however, his prestige became established, and his long record of success proved that the complications which defeated Godlee in the first brain operation could be overcome.

4

THE BRAIN ATLAS

In 1888 the British Medical Association met in Glasgow and Macewen gave his fellow surgeons several field days of practical demonstration; two whole mornings of difficult operations in the Royal Infirmary, and an epochal address on brain surgery delivered in his clear, bell-like voice in the large hall of the University, followed by a procession of successfully treated cases. Out of twenty-one brain operations he showed them satisfactory results in eighteen, the remaining three having been undertaken too late for much hope of success. At first, the large meeting of doctors received the paper coolly: its subject matter was too unfamiliar, and Macewen's dogmatism seemed perhaps too bold. Gradually the scope and breadth of this remarkable work stole over the medical audience and, on that day, Macewen was recognized, at the age of forty, as belonging

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to the great. The *British Medical Journal* declared: 'With indisputable justice may Dr. Macewen claim the proud distinction of having been the leader in this country, and we believe in the world, of this great advance of our art.' And that journal went on to say that after his address Dr. Macewen gave a demonstration of cases 'so remarkable that it alone would suffice to render the Glasgow meeting memorable in the annals of surgery'.

His success was consolidated when his great textbook appeared. It was called: *Pyogenic Diseases of the Brain and Spinal Cord*. Competent people have said that even at the present day, it is difficult to see how the teaching of this volume will ever be superseded. The title of the book reveals the nature of the brain maladies which were most treated in Macewen's day. *Pyogenic diseases* means infections caused by microbes, whose commonest beginning is in middle ear disease following Scarlet Fever and Measles. To-day, such tragedies are much less frequent and the wisdom of the book lies not least in the prophecy that since most of the brain infections described in its pages are the neglected results of children's discharging ears, the prevention of such conditions following childhood fevers is the real test of progress. Since Macewen's day, this has been achieved. Yet the book remains a masterpiece, a record of the work of one man who had chiselled delicate chips of bone from the skull of many a child to let out the infectious material, who had improved and scrutinized his results, and then written a fascinating book, one of the classics of surgery.

It was followed by an equally remarkable companion volume called an *Atlas of Head Sections*. This large book contains fifty-three copperplates like fine engravings, pictures of the brain from different aspects, each plate with a carefully drawn explanatory chart. Nothing like it had ever been done before. To find a comparison we have to go back to Sir Charles Bell's great *Atlas of the Nerves* or even to the famous *Fabrica Corporis Humani* of Vesalius. For this sumptuous and elaborate volume Macewen made the sections, took the photographs, prepared

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the charts entirely with his own hands. These two books are a high expression of craftsmanship and they possess an individual personal quality, a massiveness that belonged to the man himself.

5

CHEST SURGERY

William Macewen was now acknowledged in Glasgow as the successor to Lister. His personality had grown into a legend. However great his surgical achievement, Macewen the man seemed even greater. From that early formative period Lister's pupil had absorbed the outlook, the method. But there their resemblance ended, and the majestic, self-reliant Macewen possessed none of Lister's Quaker mildness and serene warmth. The unapproachable William Macewen moved in his own orbit, by his own light, with lesser satellites revolving around. His students called him *Guilielmus Superbus* and other less complimentary names. He was by no means an easy man to have working in a hospital. His career as surgeon to the Royal Infirmary, Glasgow, was marked by years of implacable conflict with the Managers of that Institution. He would never base his requirements on the convenient level of what others did, but he demanded more nurses, more equipment, special conditions of all kinds. Indeed Dr. Macewen's wards formed an autonomous realm inside the hospital and his controversial weapons were as keen as his instruments. His sonorous voice, his splendid presence, his artfully contrived hesitations in the middle of a sentence, his perhaps unconscious imitation of Lister's stammer, all these things made him feared. His attitude towards opponents was one of majestic indifference, punctuated by powerful denunciations. Once when he had described an antagonist as 'no better in reasoning power than a cabbage' and was asked to apologize, Macewen answered with frigid urbanity,

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‘Yes, we apologize — to the cabbage’, and penetrating, deep, blue-grey eyes flashed out of that Viking face.

His interests in surgery were those of five or six specialists. He had become drawn to the possibilities of surgery in lung diseases, which was as virgin a field as the brain. In 1895 he performed what would even to-day be considered a technical masterpiece. The patient suffered from advanced pulmonary tuberculosis, considered to be in a hopeless condition. Acting on general principles, and with no precedent to guide him, Macewen boldly removed the entire diseased lung. Ten years later, the patient was hard at work in his usual job; twenty years later, Macewen happened to see him in a Salvation Army roadside service — preaching. Forty-six years later, and now seventy years old, the same patient thought to be moribund in 1895 was still alive and working, and during those years he had been demonstrated frequently to gatherings of surgeons. In the end, he outlived Macewen.

In 1913 the International Medical Congress met in London, and a leading speaker in the section of Chest Surgery was Professor Ferdinand Sauerbruch — then working at Zurich, in later years, more notorious as the personal medical adviser of Hindenburg and Adolf Hitler. Sauerbruch in a carefully prepared paper described his method of operating on the chest in a specially constructed room in which the atmosphere was kept at negative pressure — a most costly and difficult arrangement. This he considered necessary because the pleural space immediately outside the lung is at a pressure *lower* than the general atmosphere, and it was feared that to open the chest and expose the lung to the full weight of the air at ordinary pressure would cause the lungs to collapse like deflated footballs. Sauerbruch’s paper on the Surgery of the chest was thorough and made an impression. But when it was finished, William Macewen arose to declare that elaborate negative pressure operating rooms were unnecessary, and he had always performed his chest operations in an ordinary operating theatre. He declared that Sauerbruch’s theory that air pressure would

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cause the lungs to collapse was erroneous, because the lung was kept expanded, not only by the air inside it, but by a kind of 'sucker' action which holds the lung fast to the lining of the chest. To show the principle involved, Macewen produced a pair of leather suckers with which boys amuse themselves. Macewen handed one of these round leather discs to a distinguished surgeon, Professor Kocher of Berne, who was on the platform, while he himself held the other. The leather suckers were moistened and placed in contact. They stuck together and held fast while two famous surgeons tried to pull them apart. In fact the two pieces of moistened leather held fast by 'molecular cohesion', and this was Macewen's explanation of why the lung adhered to the pleura.

The great gathering of surgeons was convinced. Chest operations to-day are commonplace, but no surgeon thinks of using Sauerbruch's negative pressure chamber.

6

PROFESSOR OF SURGERY

Macewen was now too big to ignore. When he was made Professor of Surgery (supported in his election by testimonials from the 'crowned heads' in surgical clinics all over Europe) he moved like a tidal wave from the Royal Infirmary to the Western Infirmary, Glasgow, where the managers, after some resistance, were overwhelmed. This hospital is next door to the university, where the new professor found that the only instruments for teaching his subject were some benches and a black-board. As usual, Macewen bent his surroundings to his will. A handsome new department was built in granite for him at the side of the college, where he moved his museum, his apparatus and his assistants into spacious rooms, and work went on as he planned. This was Macewen's citadel, and

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unlike other departments of the medical school which were open to the world, its door was kept locked, and those who wished to enter had to ring a bell. That was symbolic of Macewen's conception of his place in the college. Inside were wide laboratories for research and teaching, an animal house and cupboards for specimens, bones in all stages of development, deers' antlers, and examples of every disease known to surgery. Here, far into the night, the professor's light would be seen burning, and woe betide the officious night watchman who ventured to disturb him.

'I am not a co-operator', Macewen said of himself, and that saying his assistants found to be the literal truth. He was a man congenitally unable to see that any wisdom came from a group of equals working together. In his clinic and his surgical practice his own plan was followed from start to finish, and his assistants were there to carry out the master design. Towards them he played the role of majestic deity whom they revered, but did not always have the chance to love. 'He compelled the acquiescence and the service of those who were his students, his nurses, his house surgeons and his assistants. He exacted obedience and he showed little consideration for anyone associated with him whose service was not scrupulously loyal. But with all the loyalty and respect of those who worked with him, there was something wanting', one of his pupils wrote, and the sense of majestic reverence inspired by this extraordinary man in everyone who knew him is evidence of his power.

In speaking of himself he always used the royal plural — the *we* which according to the well-known jest ought to be reserved for editors and those who harbour tapeworms. During the first world war Macewen served in the Navy, where he held very high rank. His students would tell the story that Lloyd George or perhaps Lord Jellicoe (the detail varied) had summoned Surgeon Rear-Admiral Macewen to London to perform an urgent operation, and that the great man replied by telegram: '*we* are in Glasgow if you wish to consult us.'

One over-bold newly-qualified doctor, after being Mac-

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ewen's house surgeon, asked his chief for a testimonial and received the following laconic sentence: 'Mr. So-and-So has performed his duties entirely to his own satisfaction.'

Innumerable stories reveal how this deifying attitude towards himself was expressed to the world, and perhaps, if we go back in his own history, it arose because he was the youngest of twelve children and needed tremendous assertiveness to hold his own in the family circle.

On one occasion it is related that the professor happened to be in a railway carriage with two ladies, when a drunken man entered and began to use very bad language. The story is that Macewen, whose chivalry and sense of personal dignity were very marked, found a grim but effective and very surgical remedy for this uncomfortable situation. Quickly stretching his long arms across the carriage, he placed his two thumbs inside the mouth of the drunken fool and dislocated the man's lower jaw so that he sat absolutely dumbfounded and silent with his mouth compulsorily open for the rest of the journey. Then by an equally skilled surgical manoeuvre, the jaw was liberated.

When the Johns Hopkins Hospital was opened at Baltimore, Macewen was invited from among all the great surgeons of the world to become professor of surgery at any salary he might choose. But he declined. The offer was renewed with the further bait that the new professor would plan his own wards in the hospital then being built. A second time Macewen refused. Once again, it is said, the Baltimore offer was made with still further persuasions, and it was clear that Johns Hopkins would stick at nothing short of yielding up its immortal soul in order to have the great William Macewen on its staff. But he preferred to complete his work as he had begun it, on the Clyde. He was not one of those European savants who feel the call of work and riches in the New World, but remained revolving in his own orbit, with the splendid self-reliance of one who felt that in the end the world would have to come to him, or to use his royal plural, to us.

PROFESSOR OF SURGERY

Apart from yachting, his only hobby was nature study. His eyes observing birds and beasts were as keen as the eyes of the first human being. He was fascinated by the problem of the deers' horns which are shed and grow again each year, and he made many experiments to throw light on the fundamental laws of the growth of bone as revealed in this strange property in the antlered stags.

A famous fellow surgeon said that Macewen could describe the hen woodcock transferring her chicks from danger as vividly as he could describe the handling of septic clots in the brain. He would lecture, with extreme simplicity, about the mannerisms of a little brown mouse he had watched nibbling a birdseed. In 1888 he had finished his great address on Brain Surgery with the words, 'Gentlemen, there are all around us phenomena, each with its hidden truth, obtrusively impressing our senses, and how do we fail to read their riddle?' That sentence contains the whole meaning of the science and art of healing; direct, pure, uncomplicated vision of illness, observation carried to the point where the doctor indeed understands the symptom, putting aside all false analogies because some intuition tells him that he possesses one fragment of the truth.

During the first world war the professor, now Sir William Macewen, was a Surgeon Rear-Admiral, and in consequence spent most of his time in the train between Glasgow and London. About this time, for some reason that was not publicly known, he shaved off the handsome silvery beard which he had worn since he was a young man. It seemed a strange step for one who had just received high rank in a Service where beards are considered the fashion. His students ascribed the departure to this very fact, arguing that Sir William could never bear to be like other people. Such was the impression made by his inexplicable personality.

After the war he founded a hospital for disabled men and initiated a flourishing manufacture of artificial limbs, carried on by former Clyde shipworkers. As usual, he put his whole soul into the enterprise, and one day the Principal of the

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University saw Macewen eyeing some doleful willow trees in the University grounds. 'We need willow wood for our artificial limbs,' said Macewen, meditatively.

'The University might let you have those trees if you asked for them,' commented the Principal, who knew, from previous experience of the masterful ways of the Professor of Surgery, that those puny willows were not likely to withstand the irresistible force of Macewen's will.

'If you think that,' said Macewen, with still imperious gravity, 'we will ask afterwards.' Soon the willow trees were gone, and the Principal had no subsequent recollection of any request for willow trees being made to the University.

There is a curve in a man's life, an invisible graph of his progress towards achievement, then his decline from active interests, sometimes rather gradual, sometimes mercifully abrupt. Macewen worked at surgery until the last week of his life, and probably he would have found any kind of change from active clinical work an insupportable existence. But Victor Horsley was different. His second passion, that men should learn to govern themselves according to the laws of science, grew to an obsession, and he became politically minded more and more.

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VICTOR HORSLEY

Or perhaps it would be more true to say that the direction of his thought changed. He became impatient with the slow pace of scientific research as applied to social and political affairs, and he felt life was slipping away without achievement. In his youth he had spent himself profusely in jousts with nature from which he wrested many secrets. These achievements brought him fame and left behind no bitter memories. But now from henceforward he was to plunge into battles with his fellow men.

VICTOR HORSLEY

Horsley's conception of the doctor's calling was revolutionary in his time. How happy he would have been to-day! The routine of the silk hat, of sick rooms and hospital wards, the daily round between the operating theatre and consulting room accepted in 1910 no longer satisfied him. 'I thank God I entirely repudiated that idea of my profession', he said, and gradually Sir Victor Horsley was transformed from a famous scientific surgeon into a notorious controversialist. He had made up his mind that on reaching his sixtieth birthday he would retire altogether from surgical practice and devote himself to political life and to furthering those ideals of the scientific democracy which had developed in his eager mind almost to the point of explosion. Years before the first world war he had become a candidate for Parliament, first for London University, and then for a rural constituency. But he soon quarrelled with the local committee, lectured his backers about questions in which they were not interested, such as total abstinence, or views to which they were violently opposed, such as Women's Suffrage, and before long it was obvious that this fiery archangel was quite devoid of political instinct. There was not much hope in English politics for a man who proclaimed that those national heroes John Bull, Father Christmas and King Henry VIII were victims of fatty degeneration, and who denounced the mustard eaten with the roast beef of Old England as violently as he hated the beer which washed it down. Horsley was defeated by the electors of London University, and after prolonged wrangling he resigned as the Liberal hope of Market Harborough. He treated his political hearers to displays of lantern slides, but he lost sympathy and frittered away energy upon secondary issues. His political aspirations faded away on temperance platforms.

Perhaps he was disappointed, but he was too proud of his own inflexible principles to make any real effort to learn the art of understanding human nature. For Victor Horsley, human conduct was very black and very white, with no convenient intermediate ethical shades. Those who failed to adopt

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his particular views on the drink question he would stigmatize as 'alcoholic'. There was no half-way house for occasional drinkers or lukewarm reformers, and Horsley was not the man to mince his words on such profound matters. He castigated his opponents, he ridiculed their arguments, he behaved like a reforming Savonarola. He believed in attacking persons as well as institutions, he trusted in offensive action, glorified in exposing abuses, and his friends loved him while even his enemies admired him. He had the attractive quality of being overbearing to his superiors but charming to the young. He could mesmerize a meeting of Rechabites by his charm, and would rouse an audience of fellow doctors to frenzy by his insolence. In professional controversies he was always more Ishmael than Solomon. Yet in spite of this intolerance, he fascinated people. 'Horsley makes better speeches on water than most of us do on wine', it was said.

Through this political period he never gave up scientific work, and even when he was addressing Brotherhood meetings several evenings a week, he was always up early next morning to perform operations, or hurry down to the animal house to find how some experiment had turned out. As for his private patients — they could stay about until he was ready to see them. 'If people want me to continue to improve myself, they must wait', he said, and wait they did in his elegant Cavendish Square drawing-room, impatiently reading their illustrated magazines until the 'machine' drew up at the front door and a tall magnetic figure in a bowler hat and grey morning coat burst into the house. He was just fresh from dissecting the brain of a walrus at the Zoological Gardens and, overflowing with charm and self-confidence, would make those patients feel their wait had not been in vain. His personality, his touch, and his successful results in complicated cases earned him the admiring trust of people who were bored with his views on total abstinence, and had never known that he believed in 'votes for women'. His hospital patients wove round him a myth of the kind which gathers around only the very greatest

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healers, as is shown by a remark overheard one day in Horsley's ward. 'If you were to die and Sir Victor got you within half an hour, he could bring you back to life again.'

Someone said, intending a compliment, that Victor Horsley possessed three brains. But that was his greatest defect. His brains had gone to his head. Clear-sighted, far-visioned, concrete and prosaic in outlook, in spite of so many superb mental qualities, he was incapable of abstract or mystical thought. To him, human life was a beautiful mechanism, and human behaviour was no more than a series of exquisitely complicated but nevertheless intelligible reactions. He belonged to the age of Rationalism when it was deemed unscientific to refer to the soul.

These early physiologists like Horsley, these bold pioneers who had found in the brain a mystery which they steadily dispersed as more and more cells and nerve fibres were tracked down, developed a streak of spiritual pride, a *hubris* towards the world of life. Their own mental progress from utter darkness to comparative enlightenment had been too swift. They were ruthless in their demands upon science and they were confident that given the correct experiment, any problem in nature could be solved, and we recognize the heights to which their zeal carried them. Sir Victor Horsley transferred this attitude to the field of politics and lamentably failed. It is hard for a scientific man to enter the kingdom of political power.

Can we tell if this will always be so? Is it impossible for a man so gifted and endowed with strong convictions to succeed in leading the common man? In the House of Commons the medical outlook and a type of human experience that doctors find it easiest to acquire is badly needed, and in other countries doctors have played leading parts — Virchow in Germany, Clemenceau in France, but in Britain the stethoscope never seems to bring political fame.

For political aims it seems mere convictions and scientific training are not enough, and those politicians who make most

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impression are those whose thoughts are nearest to the crowd, and who live upon a borrowed capital of ideas. If a doctor happens to make a success of politics it is rather in spite of his medical background than otherwise. Professor Virchow, the great pathologist, was a pedant in a land where professors used to be highly esteemed and he led a party in the Reichstag for forty years. Clemenceau was an instinctive demagogue and never seriously practised medicine.

Victor Horsley stands out as the master scientist and intrepid operator, yet the moment he opened his mouth on a political platform, he showed painfully that he was born not to lead men, but to lecture them, and the audience sensed he was the aristocrat playing at the democrat.

Perhaps Sir William Osler hit upon the truth when he described his own attitude to politics as that of the Vicar of Bray. 'I always change with the government,' he wrote, 'it keeps the mind plastic and free from prejudice. You cannot serve two masters and political doctors are rarely successful in either career.'

When the first great war came, Sir Victor Horsley hurled his bolt at the War Office and persisted until they made him a consulting surgeon, but they gave him little surgical work to do. In that great conflict the army had not yet learned that genius was fit for something more than military routine, and the great experimental surgeon wandered to and fro, agitating and criticizing, with his great gifts unused. Eventually he was sent to Mesopotamia where a ghastly breakdown had occurred in the medical services due to a dispute between the British and Indian Governments. Horsley set about his final and saddest piece of research, probing the cause of absent drugs or dressings, and why the transport had failed. It was in a way a congenial task for his rebellious temperament, and he made his report, adding an impassioned protest against the 'financial terrorism in times of peace' which had been responsible for the scandal of a medical breakdown in war. He wrote letters to his friends denouncing the army authorities. He had his last controversial

GUILLIELMUS SUPERBUS

fling, but it was too much for his health, and he had not reached his sixtieth birthday when heat-stroke carried him off at Amarah on the river Tigris.

He was eager, positive, youthful and undismayed, and near the very end, he wrote to a friend words which show the essential humility which lay under the aristocratic arrogance of this very attractive man, 'I don't matter. I can't live for ever. It's the young that matter'.

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GUILLIELMUS SUPERBUS

Against this perpetual youthfulness William Macewen stands like a patriarch. He was in every way as militant as Victor Horsley and had probably less love for his fellow men. Like the slow power of hydraulic force as compared with Horsley's lightning flash, Macewen pursued his surgical objectives to the end. This chapter on the birth and growth of brain surgery must finish with the last great occasion of his professional life, a visit to Australia as President of the British Medical Association when he was over seventy. After the speeches and official functions were over, he went out into the lonely bush, and a new world opened to the old man who was always first of all a naturalist; it was a world of gaunt eucalyptus trees, brilliantly coloured birds and strange creatures from kola bears to man-sized kangaroos. The distinguished surgeon was delighted, yet melancholy. He felt that a whole lifetime of learning how to observe had just brought him to the point where these new adventures in natural history could be joy and profit. But at seventy, on reaching the summit of that experience, he could see only too clearly that the prospect of the duration of life was

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short. Sir William Macewen tasted the regret of a labour-loving man that life does not last longer for the still unperformed task.

A few months, and he was back on the Clyde, performing operations, working long hours in his private laboratory like an inexorable engine of research. He still possessed that extraordinary power of making men do his will, either from conviction, veneration or fear. The old fire was not burned out. In that year he showed a distinguished English surgeon round his wards in the Western Infirmary, demonstrated patients with all the zeal of a young intern. And frequently, as they passed from bed to bed, Sir William Macewen would break off his surgical discourse to utter strong invectives against the Governing Committee of the hospital with whom his warfare had never ceased for thirty years.

One night when visiting the infirmary to perform an emergency operation, he took cold. Pneumonia, which gives a quick exit to old age, overtook that majestic graceful body. William Macewen had trusted once too often to his own unaided resources.

While the toxins circulated in his blood and he was obliged for the first time in his life to lie inactive, his mind floated back to the year 1869, to the foul smell of the wards in the old Royal Infirmary with their ligatures hanging out of wounds, with erysipelas and death. One day as a house surgeon he had actually fled from the ward in disgust, and was standing in a corridor taking a breath of fresh air. An old servant of the hospital said as she passed by: 'What ails you, laddie?' And the young Macewen had told her of his discouragement. The old woman must have measured him up for she said encouragingly: 'Then ye must gang back and set it right', and that blunt speech had driven away his moments of despair. Now after fifty years as he lay in bed with pneumonia it all seemed a brief adventure, and those early days had been the best, and he reverently murmured things that 'Mr. Lister' had said long ago when surgery was young.

THE BRAIN IN THE FUTURE

Sir William Macewen died at the age of seventy-four. He had shown what one man venturing alone could do to make a path into the dark forest of human suffering. He is the greatest among the great followers of Joseph Lister.

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THE BRAIN IN THE FUTURE

In darkened operating rooms the successors of William Macewen and Victor Horsley pore over a single brain operation for hours at a time, illuminating its glistening surface with electric lamps. The skull has been opened through a hinged doorway kept wide apart during the long tedious operation. The difficulty of this work lies chiefly in the fear of haemorrhage, since the brain's covering gauzelike membrane is rich with thousands of blood vessels per square inch and none of them can be left oozing. Nor can the minutest injury be done to the brain cortex underneath. For this is the very headquarters of life and thought, and each cell is here of irreplaceable value, unlike other parts of the body which can stand up to injury and insults. So the small bleeding points have to be dealt with slowly one by one. Modern anaesthetics and drugs for reducing bacterial infection give the surgeon plenty of time to complete his delicate work, and the old drama of Macewen's day has been replaced by a slower tempo, more monotonous yet more secure.

The type of brain operations has altered too. The old abscesses so beautifully described and handsomely illustrated in Macewen's *Pyogenic Diseases of the Brain* and due to running ears, have disappeared, and to-day the surgeon operates mostly for tumours and not only on the brain, but also on the pituitary gland, that still mysterious body astride its bony saddle at the base of the skull. The ancients used to think the pituitary was

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the seat of the soul, and perhaps they were not far wrong, for its influence intimately affects everything we do, and feel, and are. The pituitary to-day can be revealed only through surgery, but to-morrow it is likely that medical treatment without opening the skull will be able to control its function.

There are stranger marvels in brain surgery than even Macewen and Horsley ever saw. The more knowledge we have of the brain 'cortex', the more impenetrable grows the enigma. Those places where our thoughts are born cover wide areas of the brain, yet substantial parts of those areas have been surgically removed without the patient being any different from the normal, which seems to show that we can get through life with less brain than we believed.

The greatest of the successors to Macewen and Horsley has said that in brain surgery we are still in the Stone Age, and perhaps all this complicated skill is no more than a phase which will pass away as our understanding of cerebral function grows. New research is bringing out facts and strange phenomena hardly dreamed of. The minute electrical currents given off by the brain cortex during thought can be measured and are suggested in criminology to detect hidden reactions, and their use has been flamboyantly called 'Lie detection'. Violently exciting drugs are given to drive the motor cells of the brain into a temporary delirium which is often followed by a merciful clearing up of mental disease. Nerve fibres connecting different parts of the brain have been cut, and the patient has experienced a sudden lifting of a weight of melancholia and mental depression. Whether we regard the central nervous organ on the one hand as nothing but an intricate nervous mechanism, a musical box of ordered structures fashioned to produce tunes which we call thoughts; or whether we think of it as the theatre of soul dramas, supremely responsive to the instincts and emotions — the human cerebrum still remains a mystery sealed with many seals. At the moment, the corporal way of approach has gained most adherents. Dr. Witts, Nuffield Professor in Oxford University, has said that for the present the

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method of physical experiment which is the direct continuation of work done by William Macewen and Victor Horsley offers most chance of success in giving us control over that organ which is in supreme control of us. But at any moment the pendulum may swing back, and the spirit and essence of mind which is the brain's purpose may be captured by some daring effort of psychology or philosophical research. Then we may commence seriously the most responsible task ever to be attempted by science: that of educating the brain of man.

PART SIX

ROBERT WILLIAM PHILIP
AND
EDWARD LIVINGSTONE TRUDEAU
IN
THE CONQUEST OF TUBERCULOSIS

BACK TO THE PYRAMIDS

'THEY unwind, unwind, unwind and still unwind, with no apparent diminution in the size of the package and no feeling, as it were, of approaching the body. The band seems to grow as they work and threaten never to come to an end, while the attendants continue their interminable unwinding. At one moment, in order to get along faster and hasten the stripping of the creature, the mummy is set up on its feet, which knock as if at the end of a pair of wooden legs, and the thing begins to twine and gyrate and waltz horribly in the hurrying arms of the attendants: the package stands up, Death in a bundle. The thing is laid down again and the unwinding continues. The yards and yards of cloth pile up, rise mountains high, cover the table with the charming russet saffron tone of this never-bleached stuff, and strange smells begin to arise, warm and spicy emanations of funeral myrrh and aromatics — the odours of black voluptuousness of the bed of the antique corpse.'

That scene was in 1867, and the pen of Edmond and Jules de Goncourt has preserved for us the impression of strangeness and wonderment which this rediscovery of ancient Egypt first made upon the Western World. Life as it was lived three thousand years before was suddenly made real, and the details of a complex ancient civilization then exposed for the first time showed that, in some things, man had changed very little. An unexpected discovery was that the classical Egyptian suffered from one disease that is still not conquered. Tuberculosis was then as much a curse of the Nile Valley as it is to-day. The mummified form is uncovered and exposed to the light of day. An inquisitive eye discovers in that eternal skeleton a stiff joint and a malformation of the spine. The bodily tissues have thrown up against the germs a barrier which is unmistakable

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and can be confused with no other disease. A long warfare between invader and sternly-resisting body cells — that, put simply, is the story of Tuberculosis. So it is to-day, and so it was in some sun-baked mud villa in the neighbourhood of the Pyramid two thousand years before Cleopatra wooed Antony.

In the twentieth century tuberculosis accounts for one million deaths yearly in India alone, and the total number of its victims in the tropics has never been properly estimated. It is seen in the Eskimo igloo and the London tenement, it affects the athlete, the infant, and the peasant from Eire and the dweller in the New York slum.

Tuberculosis has been the special foe of genius. Its own special toxin has even been considered the main source of poetry, and it has been the prime cause of many romantic illnesses and illustrious declines. Around tuberculosis has accumulated so much legend that even to-day, when its nature and cure are better understood, it is difficult to present this disease with wise eyes that can foresee its ultimate eradication as an objective well within the power of hygiene. We might expect that in so long a history some useful knowledge might have been accumulated. But the very opposite is the case. Until the lifetime of people who are to-day only middle-aged, there was no really effective method of controlling tuberculosis, and eighty years ago our outlook on the subject was very much where the Greeks had left it. Tuberculosis was confused with other chronic diseases, and its common name, *Phthisis* means decaying or wasting. There was a second name, *Scrofula* (literally the disease of swellings) which was one of the lesser forms of tuberculosis. From James I down to Queen Anne, the reigning sovereign was supposed to have the power of curing scrofula by touching, and it received the name of 'King's Evil'.

Stone-grinders and wool-workers had their own special varieties of phthisis. Certain families lost members through it in several generations, and the gloomy belief that the disease was hereditary became part of popular tradition.

THE BRETON GENIUS

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THE BRETON GENIUS

The first modern figure in the control of tuberculosis is the French physician, René Théodore Hyacinthe Laennec (1781-1826), who made one of those curious practical discoveries that are for the time passed by almost unnoticed, yet prove to be the start of a new outlook. Laennec was an acute physician and it occurred to him to listen to the small whistling sounds made in the chest as the air rushes in and out in breathing. To hear them more clearly, Laennec rolled up a sheet of notepaper to form a tube, and put one end to his ear, and the other to the patient's chest. In this almost accidental way was born the Stethoscope, and a whole new branch of medical diagnosis. The sheet of notepaper presently evolved into a cylinder of wood bored down the centre, and later a thin wooden tube with a flat earpiece, such as was carried inside the silk hat of every Victorian doctor. The modern form, popularized by Sir William Osler when a young man at Baltimore, is a pair of metal earpieces connected by rubber tubes to a small box which picks up the sounds from the patient's breathing.

Like every other invention, the stethoscope was scoffed at, attacked, and neglected as John Elliotson found when he introduced it to London medical students. But Laennec belongs to history. He was a physician of character and wide influence, and his clinical discourses at the Hôpital Necker no visiting doctor missed. He became court physician, edited a medical journal, and was elected Professor in the Collège de France, all before the age of forty-one. Throughout this strenuous professional life he was frail and tuberculous, and more than once retreated to his farm in Brittany, a pleasant manor called in Breton, Kerlouarnec, which means, 'the foxes' den', and there he recuperated, shooting pigeons and practising the Breton language which he had forgotten since his childhood. The day came when he returned to Kerlouarnec for the last time and died of consumption at the

age of forty-five. Laennec not only invented the stethoscope, but became an artist in using it, and mapped out the sounds heard in various parts of the chest. The book he wrote is the foundation of modern knowledge of chest disease and with him began the real study of tuberculosis. He put an end to the distinction between scrofula and tuberculosis, and proclaimed that all forms of consumption, whether affecting the lungs, glands, bones, joints or other organs of the body, were due to a single cause. Precisely what that cause was, Laennec did not know. Certainly he did not think it to be a germ, for no germs had been dreamed of when he died in 1826. Laennec did not even believe the theory that consumption was infectious. Perhaps if he had lived longer, he would have come to this idea which was actually proved by another Frenchman in 1865, who succeeded in transmitting tuberculosis from one animal to another, though still without actually finding any germ. This, indeed, was not discovered until 1882, and to show the state of knowledge of the subject in early Victorian times, before the truth of Laennec's teaching had dawned on the medical profession, we must glance at a book by a certain Dr. James Clark, Physician to Prince Leopold, the Duchess of Kent, and afterwards Queen Victoria. He was, in his way, a great authority on tuberculosis, and had studied it on the Continent (where he happened to attend the poet Keats in Rome) as well as in England. But Clark had not grasped the full meaning of Laennec's theories, and he reverses the early and advanced stages of consumption, blaming to the latter events which have really caused it. Clark is a lucid writer, yet the impression he leaves is rather like the clearness of fog. He describes every phase of the disease as we should now see it, but he has no glimmering of the truth. He regards consumption as caused by heredity, a disordered state of the digestion, impure air, deficient exercise and want of cleanliness. Clark's recommendations upon treatment are varied and vague, and they show that in handling this ubiquitous malady the Victorian doctor could command only ineffective remedies. He mentions mercury,

THE MARVELLOUS KOCH

iodine, antimony and sarsaparilla and mineral waters. He advises reading aloud, and swinging clubs. Emetics are discussed for several pages. His practical treatment for consumption was nothing but a series of expedients which may have eased the patient, but can have had little effect on the disease itself. Despite his unresponsiveness to the new currents of thought, Clark is surprisingly modern on the subject of hygiene, and some of his notions were quite advanced in 1835. He recommends loose clothing, avoidance of bed curtains, and adds solemnly: 'A warm bath ought to form an appendage to every boarding school and every girl should *occasionally* have the benefit of it.' After years of residence abroad, Dr. Clark was the great exponent of climatic treatment and writes that 'a residence in a mild climate for some years will greatly promote the restoration of the general health and tend to prevent a recurrence of diseases of the lungs'.

In this book we cannot escape the persistent woolliness of thought, and the sense that, in each difficulty, the distinguished teacher flies off into vague conceptions beyond all possibility of being proved.

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THE MARVELLOUS KOCH

Then came Louis Pasteur, and it no longer needed courage to imagine all the maladies of human flesh as caused by invisible microbes. One by one, common diseases were tied down to particular germs which could be seen with the human eye, and grown just as seeds are grown on a piece of flannel, and at last, in 1882, the plodding Prussian, Robert Koch, retired to village practice after the Franco-Prussian War, found the germ of consumption.

Koch had identified several new germs before this one, and

he was drawn to tuberculosis by an instinct for problems of first class importance. Laboriously he examined specks of tissue from tuberculous patients; he searched the consumptive's spit, and stained it with the rainbow of chemical dyes which were coming from the chemical factories of the newly-born Third Reich. This dye manufacture was all developed out of an Englishman's discovery of a substance called *Aniline* which was quite neglected in the discoverer's own country. The new colours were the foundation of research into bacteriology.

Koch's method was to apply various chemicals in the hope that one day the dye and the germ (as yet only imaginary) would come together. Then he found both the dye and the germ; or rather, the accidentally chosen colour showed up a living organism which instinctively Koch recognized as something new, giving it the name of *Tubercle Bacillus*, generally shortened to T.B. Its modern biological label is now *Mycobacterium tuberculosis*, but the old familiar form which Koch used is kept here. He found the germs in all sorts of organs, and in all kinds of tuberculous disease — lungs, glands, bones. What was even more remarkable, he made the germs grow in his laboratory on a prepared potato, and when *Tubercle Bacilli*, artificially cultivated in this way as easily as tomatoes in a greenhouse, were injected into a guinea-pig, it developed tuberculosis. The cycle of proof was complete — human tuberculosis — germ — cultivated germ — tuberculosis in the animal. Describing the fruits of three years of labour, Koch's scientific paper delivered in March 1882 before the Berlin Physiological Society is brief but effective. The method had been perfect and the results were unassailable. Koch had proved the cause and explained the transmission of tuberculosis with the clearness of a theorem in geometry, and his demonstration has never been bettered. This discovery was the start of man's control over tuberculosis, and the exploitation of Koch's work for the benefit of man is largely due to a newly-qualified doctor from Scotland, who was twenty-seven years old when news came of this revolutionary evening among the physiologists of Berlin.

KOCH'S INSPIRATION

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KOCH'S INSPIRATION

He happened to be in Vienna, on his post-graduate year, and was rather drawn to the idea of specializing in gynaecology. His name was Robert William Philip. When he heard of the announcement of Koch's work, he began to stain specimens of spit, and there, under the microscope, the clear red outlines of Koch's *bacillus* whispered to him that he must renounce everything else and follow. Philip had fifty years of active life before him and he never swerved from that purpose, never allowed any other purpose to supplant that falling in love with tuberculosis — for that is the phrase he always used, as the memory of his own dedication in 1882 became sentimentalized by repetition.

Fifty years afterwards Philip wrote: 'I am happy to take this opportunity of rendering homage to the man of genius who impelled me to study of the portentous question opened up by his discovery.' That was the article of the Philippian faith, and 'Koch's guinea-pig' was always appearing in his lectures, like a King Charles's head.

About the same time another young doctor, Edward Livingstone Trudeau, had learned in America to use the magic stain which throws up Koch's germ and reveals its presence and infinite power for harm. Trudeau was a desperate investigator in quite a different case from Philip. For while Trudeau was himself a consumptive, Philip belonged to that sturdy type which knows illness only from the outside. These two men founded between them the modern study of tuberculosis, and they are the more interesting because they stand at its opposite poles. Let us first follow Philip's career as he returned to Edinburgh bursting with the new inspiration. When he announced his resolve to specialize not in gynaecology but in tuberculosis, he was met with the superior remark that the subject was 'worn to shreds', a phrase which reveals the sterility to which

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long defeat had reduced the profession. But Philip possessed an adapting, developing talent, that exploits the discoveries of others, one of those whom Osler called the transmutors. It seems surprising to-day that any reasonable man could hear of Robert Koch's discovery without perceiving that Philip's deductions drawn from that discovery were inescapable.

In 1882 most doctors thought of Koch's *bacillus* as an interesting by-product, not likely to influence clinical medicine. How could finding a germ in a few seriously ill people help the doctor to cure other patients? That was the average opinion of those 'practical' men who live in every generation and whose lack of imagination makes them the most unrealistic guides. Someone was needed to demonstrate the now-proved fact that the germ was present in every case of tuberculosis, could be used to detect the disease and also to prevent it. This Philip set himself to do. He turned Koch's purely bacteriological discovery into a social instrument.

The chief antagonist of the post-Koch conception of tuberculosis was Romance. For this disease has always been blended with poetry, nostalgia and tragic despair. Mozart, Chopin, never reached the age of forty because this insidious enemy had eaten into their lives. John Keats was only twenty-six, Robert Louis Stevenson was forty-four, when they were compelled to surrender. The fascinating contemplation of the unwritten poetical dramas of Keats, the surmised symphonies of an older Chopin, the mature works of Stevenson in middle age, yes and all the wasted potentiality of many lesser figures who failed of lasting achievement because they were tuberculous, has surrounded this malady with a specially poetic and tragic flavour. It has even been suggested that genius must be ascribed to a toxin, that Chopin's melodies were due to the fact of his disease, and that Emily Brontë wrote because she was tuberculous. It is false logic. For every genius who has died of consumption, there have been a hundred ordinary people, and countless village tombstones tell the story of whole families carried away by 'a decline'.



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KOCH'S INSPIRATION

Philip firmly put aside these romantic associations and began to work out the incidence of the disease in his own city as a sober problem in family infection.

When a man starts with a new idea, and drops overboard previous conceptions as so much superfluous ballast, it is surprising how much progress he will make. A concentration of forces and abandonment of tradition give an air of decisive swiftness. Philip's early campaign in the Edinburgh slums was something entirely original in medicine.

It was the era of the carriage-and-pair and of the silk hat; physicians were still great gods who were summoned when the lesser gods (herbs, homely remedies, prayer and purging) had failed to answer the call. For reasons of expense and scarcity, the consulting physicians' part in an illness was usually limited to a single visit. A lengthy prescription, in Latin botanical terms and containing perhaps sixteen ingredients, was debated and composed. Port wine and spirits were solemnly advised, or interdicted. In cases of phthisis, closed windows, the avoidance of night air, and sometimes horse exercise were the usual remedies. A lowering or stimulating regimen was ordered according to the physician's viewpoint. Laennec's stethoscope was used to map out the extent of the disease as far as possible from the meagre indications which it gave to the ear. Specific treatment there was none, any more than in Sir James Clark's day.

Yet these older physicians were wise and observant men, well versed in human nature, and able to estimate very shrewdly what turn a particular illness was likely to take. But towards consumption their attitude was wholly static. Its prevention, as a practical policy, had never occurred to them, and the economic consequences, the loss of wages, the gradual social degradation due to exhaustion of the family exchequer, the false hopes and real despairs, the possibility of giving the consumptive suitable work — all that we should call to-day 'Rehabilitation' — was far outside the doctors' range.

Philip had stumbled on a preventive idea of the greatest

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value as he realized Koch's discovery required a fresh technique of handling the consumptive family.

Every young doctor starting his career likes to join up with some club or hospital. It brings patients, gives him professional background, and there are usually several institutions willing to accept his voluntary services. Philip opened a clinic to treat accidents among the workmen who were building the Forth Bridge. When that enterprise was finished he changed direction, and opened the first Tuberculosis Dispensary.

This word Dispensary, somewhat misleading in the new context, was in current use in Edinburgh to describe charitable agencies which provided out-door relief and medicines to the poor. At first, Philip's new enterprise was nothing more than a few rooms, where a mass of wretched consumptives flocked to see the doctor. Patients were examined, they took away their medicine, and returned to the overcrowded wynds and closes where the *Tubercle Bacillus* continued its operations in their lungs, in dust, air, and by invisible but deadly transfer to others.

This sowing of the seed, this implantation of the germ in a healthy person from some consumptive living close at hand was a phenomenon which a doctor brought up in the days *before* Koch did not realize. To Philip it was the all-important clue to the later mystery of why consumption developed in that particular individual. He knew from experience that the entry of the germ into a patient's system was likely to happen in several members of the same family. Therefore, he insisted on seeing them all, the healthy ones as well as the ailing. He sent for them, and if they failed to come, he went to the house and examined them, using tact or even more robust measures. Arrived at the Tuberculosis Dispensary, the whole family 'Marched Past' and were scrutinized for signs of incipient disease. It was a novel idea that anyone should go to the doctor until he felt ill, and Philip was even more ridiculed when he marked a map of certain poorer streets in Edinburgh with a red cross for each house where there was an adult coughing

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out germs, and probably children who would be the consumptive patients of ten years' time.

To-day we take environmental medicine very much for granted. Poverty and overcrowding, unemployment and malnutrition are accepted as fundamental allies of disease and it is hard to think back sixty years to a period when medicine, long in the womb of antiquity, had not developed the wings of its social purpose. The novel Tuberculosis Dispensary was soon known to every consumptive in the city. Philip had nothing to offer in the way of a new drug, and it was obvious to them all from the pathetic line of patients in the waiting room that no lightning cures were to be expected. Yet the young Dr. Philip did give them something. He gave hope. He showed to those miserable consumptive wretches who were shunned in the ordinary hospital and out-patient room, an intense concern for their physical surroundings which had the effect of supporting their wavering wills. He insisted upon a new sort of discipline in their lives, both night and day, as a principal part of the treatment. He introduced a new and revolutionary fashion — the open-air treatment. This open air idea was, to most of those patients in Edinburgh, a stern, even a terrible thing. The idea which was so new in 1882 had a much longer history and is worthy of a short digression from the story of R. W. Philip.

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FRESH AIR

It had happened before in the history of science. A new formula for action is discovered, becomes fashionable, is practised for a time, and then lost, as though the seed had no vitality, or the soil was exceptionally uncongenial. Like most ideas that have influenced Europe, the idea of the 'Fresh Air Cure' really

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belongs to classical Greece, where that profoundly natural cult of Aesculapius flourished in rural temples and mountain valleys, beside sacred streams and among secluded trees. The patients congregated in shady pine groves and followed a mystery practised by doctor-priests, in which bathing, resting in long cloisters and quaffing water from the sacred spring made up a religio-medical regimen.

The dark night of the Middle Ages descended, and this pagan conception of the way to good health perished utterly. Open air used as a method of medical treatment is one of those genuine creative ideas which do not die. It was born with the Greeks, it disappeared, but it came again to life in the everyday practice of an English general practitioner a hundred years ago. He was George Boddington, of English yeomen stock who, after medical study at St. Bartholomew's Hospital, London, and a diploma in Edinburgh and a doctorate at Erlangen, settled down in a village near Birmingham. Boddington is described as a 'good solid and fluent speaker', he had a good name as a physician and magistrate in times when a few drugs in one saddlebag and some obstetrical instruments in the other, were the doctor's sole weapons against disease. Such men, in mid-Victorian days, were all-round savants, and as a matter of course they published papers on local antiquities and natural philosophy. In 1840, George Boddington brought out at his own expense his famous essay entitled *The Treatment and Cure of Pulmonary Consumption, on principles natural, rational and successful*. Not a treatise, or a textbook, just an amateur essay by an apothecary with a taste for learning. He addresses himself solely to curing the disease and makes modest suggestions for 'an improved plan of treatment among the lower classes of society'. He does not deal with the *cause* of consumption, but applies himself only to its effects. In Victorian England, it was dangerous to meddle with *Cause*. Acceptance of the Creator's plan required silent acquiescence to many enigmas of nature, and there were powerful authorities prepared to rebuke presumptuous village doctors who ventured outside the *practical*.

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But to promulgate a method, especially one which applied to the lower classes, was perfectly safe!

There was a theory in vogue at the time that the fever in consumption was caused by *Phlogiston* — an imaginary influence which no one had ever detected, which was in fact merely a form of terminological escapism. To counteract this entirely supposititious substance so called *anti-phlogistic* remedies were used, such as bleeding, cupping and purging. George Boddington would have none of this.

But his chief innovation lay in the use of proper ventilation. He makes short work of the accepted treatment 'excluding the access of atmospheric air, and thus forcing them to breathe over and over again the foul air contaminated with the diseased effluvia of their own persons'. Blisters, leeches and plasters, sending patients to watering-places, he dismisses as useless. One might think that of nineteenth-century therapeutics there was nothing left, but Boddington has one great specific: 'the only gas fit for the lungs is the pure atmosphere freely administered without fear'. He believed in preserving the patients' strength, nervous system, and muscular tone by good feeding. 'A glass of good sherry or madeira in the afternoon, with an egg, another glass of wine after dinner, fresh meat for dinner, some nourishing food for supper such as sago or boiled milk' — that was his very encouraging form of diet in tuberculosis. Above all, he believed in activity — early rising from bed, a walk in the garden before breakfast, horse-riding before lunch, riding or walking in the afternoon, to bed at eight o'clock in the evening — with window wide open and only occasionally a fire in the room.

This strenuous programme seems to have given good results with George Boddington's patients, though nowadays such violent exercise for tuberculous patients would be condemned as violently as he censures the antiphlogiston theories. He had difficulty in getting his ideas carried into practice, and to meet this he suggests the use of special country houses for patients to be treated under the doctor's strict eye, where they would do

gardening and farming as convalescent pursuits. He even goes on to propose that certain doctors in the cities should specialize in treating consumption, so that the miserable patients should not fall into the clutches of 'mercenaries' (he means landlords) in distant seaside resorts. Lastly he advises that some consumptives when convalescent or cured would be better not to return to their former employment, but should become agricultural labourers or gardeners to allow them plenty of open-air exercise.

Such is the slender, but profound substance of George Boddington's teaching, expressed within a few pages, and with dramatic examples of success. In every respect but his insistence upon strenuous exercise, it is a very modern and reasonable programme. It anticipates sanatoria, tuberculosis officers and 'After Care'. But Boddington's ideas passed away like the fresh air he recommended. As a method of treatment his open air method perished before its author, who lived on until a few weeks after the *Tubercle Bacillus* was discovered by Koch in 1882. Boddington's name and fame survives only in this unpretentious pamphlet which had made no impression at the time.

The world continued to believe that draughts were pernicious.

It was in Germany that the open air idea was born again and became a cult of indiscriminate popularity. It took on some of the features of the old Aesculapian religion, and portrayed good health as a goddess of locality, a rather coy young goddess, partial to special places that were inaccessible to the vulgar herd. We are getting near to the modern 'open air cure' with its high alpine hotels and medical stations far removed from the haunts of work and commerce. The simple idea of obtaining good health merely through breathing the universal atmosphere was too commonplace and sub-varieties of open air treatment, each laying stress upon one particular facet, became popular.

It was Dr. Hermann Brehmer whose sanatorium at Gorbisdorf in Upper Silesia, a picturesque castellated building in the

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forests, really initiated the modern sanatorium idea. Brehmer pinned his faith not only on fresh air, but on bodily exercises for his patients, and each day his clients were driven forth, up and down the mountain side. Near to the principal building was Dr. Brehmer's 'second class' sanatorium where poorer patients followed the same system and for years this assembly of three or four hundred tuberculous patients was the largest sanatorium establishment in the world.

Then there was Dr. Dettweiler's *ménage* in the mountains at Falkenstein near Frankfurt. He believed in long rest, taken on verandas, balconies and summer houses, and accompanied by friction of the skin. The patients were put through dry rubbing, and massage with spirit, passing on to cold showers. In actual fact the number of bath-tubs provided in the establishment was strictly limited according to modern ideas, and only three trained nurses were thought necessary at Falkenstein. There were, however, compensations outside and an English visitor reported that the nearness of the village inn, 'though in some respects convenient, might in certain cases be an hygienic danger'. Apparently Dr. Dettweiler's patients were not exempt from human temptation in their monotonous lives.

But of all these early German 'healing stations' the most famous was that of Dr. Walther at Nordrach, three hundred feet above the Rhine near Strasbourg, a small private concern carried on in a typical Black Forest building with wooden balconies and turrets. Here Dr. Walther lived among his patients, and his presence in the dining-room was a stern reminder of one of his cardinal principles of cure, that each must eat and also retain what he consumed. Good and plentiful food, with complete rest for body and mind — that was the Nordrach plan. The doctor's insistence on large meals gave rise to grim stories about patients being made to eat until overcome with nausea and sickness, and then forced to come back and finish the meal they had been obliged so precipitately to break off. Such legends about Nordrach became notorious and were of course denied by Dr. Walther, but they show that in these early days at the

beginning of the present century, desperate discipline and strenuous routine were considered essential to bring the frail consumptive under the control of his doctor. But on the whole, Walther was sensible in his views. He discouraged overcoats, medicines, and long walks, and paid no heed to the weather. Relatives and friends of patients were not welcomed at Nordrach, being considered a source of fuss and distraction, and as mental repose was aimed at, there were no organized amusements. Mental excitement, business worries and even entertainments were the very antithesis of the 'Nordrach system', which became widely and justly famous. Imitation Nordrachs sprang up all over Britain from *Nordrach-on-Dee* in Aberdeenshire to *Nordrach-on-Mendip* in Somerset. The very name, Nordrach, seemed to acquire a healing quality, and any house near some pine trees, where tuberculous patients could be well fed under an enthusiastic doctor, was enough for a sanatorium and the term 'Strict Nordrach' became the hallmark of sound treatment.

It was now accepted that the cure of consumption involved exile and repose in the open-air and Nordrach's pine forests and far-away locations gave the consumptive a romantic glamour.

Though the special ideas connected with the Nordrach system have now been widely modified, there is still attaching to the consumptive an ideal of remoteness, as may be understood from Thomas Mann's Sanatorium novel, *The Magic Mountain*, in which the characters in a Swiss high-altitude resort speak nostalgically, yet with supreme detachment, of the life they have temporarily left behind, and try to fill their boredom with extravagant escapes into philosophy and speculation.

The value of the open air life was thus established through practical experience by Boddington and Walther before ever science showed this clinical intuition was sound, and that breathing the spacious atmosphere of pure air aerates the lungs more deeply. Countless air vacuoles in the lung never properly opened in our restricted urban lives now come into use, and in

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this way more oxygen can be absorbed into the blood. This means that more red blood cells are formed and since the circulating blood is nothing but an oxygen-transport system, richer blood means that more oxygen is conveyed to every cell in the body, producing greater vitality, higher efficiency and less fatigue. Even a few weeks day and night in the open air provides a tremendous stimulation to all vital processes, and every consumptive in a modern sanatorium goes through the experience of a sojourner at one of the ancient temples of Aesculapius.

Such was the stage of development in the 'open air cure' when Robert W. Philip began his work in Edinburgh in the 1880s. It was a remote and rarefied conception of treatment, and sanatorium life had become associated with mountain tops, foreign travel, and, of course, was only possible for those fortunate few who could afford to abandon home and family to seek cure afar off.

Philip saw this was impossible in the average case, and he now proceeded to bring open air to his patients, both as an idea in physiology, and a method of living.

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He became the pioneer of the open air conception and method applied to city slums and ordinary domestic life. Patients who attended his Tuberculosis Dispensary were taught that 'open air' was not the prerogative of those who could visit the Swiss mountains and pine forests of the Black Forest. 'You must use the open air that is outside every honest man's window' was his favourite prescription, and Philip certainly performed a miracle in bringing fresh air, so to speak, down from the hills, and making it a homely remedy for the majority of his patients, and

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he poured scorn upon the Nordrach magic and health-resort propaganda. Nurses from his Tuberculosis Dispensary were ruthless in enforcing the open air rule in the patient's home. Something fresh, heroic, and very sanitary came into the lives of this band of enthusiasts trained under Philip. Patients were nursed in garden sheds, on balconies, in country cottages: clothed in blanket costumes, Balaclava helmets and mittens, they braved the Scottish winter, far more trying than the climate of Nordrach. The Dispensary premises were swept by draughts, while the respectable Edinburgh public shuddered behind heavy curtains and used sausage-shaped guards to guard against the entry of air by cracks in the window sash. After ten years, the Tuberculosis Dispensary acquired its own sanatorium built on the outskirts of the city with open air wards and open space between the 'butterfly' pavilions. The Dispensary had become an organization — clinic, hospital and sanatorium — and was now managed by an influential Committee, and at the date of Queen Victoria's Jubilee the federated units were formed into a whole and rechristened the Royal Victoria Hospital Tuberculosis Trust.

The creator of this scheme, still the only thing of its kind in the whole world, had 'arrived'. Philip removed his early beard, and adopted the clean-shaven hygienic cult of the twentieth century. He used a measured style of speaking, and was a fashionable consultant in Charlotte Square. Married to a wealthy and witty Irish woman who had once been a patient, he was becoming known all over the country. His silk hat, smart turn-out and elegant manners made him the model family adviser. This man whose medical ideas were so revolutionary never shocked the social proprieties and beneath this dignified conformity with what the world of the start of King Edward's reign expected of a consulting doctor, he developed a remarkable power of inspiring others, especially society men and women, and he was using the methods of a revivalist, reiterating a simple message until it became an incantation, and managing to give his platitudes the air of great truths. Genial

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and solemn at the same time, he always appealed to people's common sense. Here was consumption, infectious, curable, and a family disease — if there were a single case in the household, there were sure to be others who might have the disease in an earlier phase; two sisters, for example, one of them nursing the other through a long illness, only to find, when her patient had recovered, that she herself was now a victim of the disease. To forestall such a tragedy was real preventive hygiene. What it is now fashionable to call 'Social Medicine' was born in Philip's dispensary when he realized that in tuberculosis the cure could not be achieved by the doctor alone, but that the conscience of the public, the goodwill of neighbours, the assistance of the State had to be aroused and exploited.

This was his gospel founded on daily achievement among the consumptive poor at the Royal Victoria. Philip had the sane man's belief in the power of simple things, and he used no fancy or elaborate methods of treatment. To this there was one exception; *Zomotherapy*, the word means the Raw Flesh Cure, and it was one of Philip's few fads, generally carried out in the form of uncooked beef sandwiches. He mistrusted pseudo-scientific remedies, yet the plainer he made his system, the more the world insisted on turning it into a mysterious cult.

The real trouble was frequently not in the patient's bodily organs, but in his pocket, for usually tuberculosis meant a serious consumption of the purse. Forty years ago of course there was no free treatment, no Health Insurance and the tuberculous patient struggled on alone, pitied but neglected. When at last he achieved a precarious victory over his disease he would be faced by the cold economic world, with severe competition, long hours, unsuitable environment — in fact all those conditions which had made him the victim of tuberculosis. Was the great effort lavished on curing the patient in Philip's dispensary then to be thrown away? Was the open air belief just a fallacy and the sanatorium method only a dream? Were patients to be led to expect a perfect cure when all that faced them was economic ruin?

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Philip's answer was the *Farm Colony*, an audacious experiment in social welfare which expressed Philip's theory of the perfect life in a rustic paradise. A group of patients at various stages on the road to cure lived under sanatorium conditions and escaped the monotony of a long empty day by working in the fields under the eye of a doctor who prevented overstrain. When cured, they would go to live permanently on farms, and practise for the rest of their days the open air life. In theory it was admirable, yet few town-bred tuberculous patients really enjoyed the farm, and often they disappointed Philip's expectations by drifting back to the old life in the unhygienic cities. Rural Utopias have seldom had any better fate, and the Farm Colony was Philip's least successful idea.

In the nineteenth century it took tremendous momentum to produce a very tiny result. Instead of the thousands who were never reached by them, such social experiments catered for dozens. Those early reformers seemed all too afraid of making a mistake, and the modesty of their proposals rather shocks us to-day. There were well over a million consumptive patients in Britain alone, while Philip's early plans cover only a few hundreds.

Yet taking a proper measure, we must accept the Dispensary for Tuberculosis as one of the really creative ideas of nineteenth-century medicine.

Philip's chief interest in medicine had now become that of an organizer of the preventive outlook, and the whole unfolding of anti-tuberculous work showed that his instinct was sound. Many new drugs have been, and are still being tried, but the great fall in the tuberculosis death rate which has taken place in the past half-century is due more to general hygiene and Philip's social programme than to any great advances in purely medicinal treatment which did not interest him. To this generalization there is one exception. Philip was always fascinated by that famous fluid which Robert Koch discovered and called *Tuberculin*, a romantic, perilous and very important discovery.

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It is really nothing but an extract of dead *Tubercle Bacilli* and contains some of the fluid toxins of the germ. In fact it is known that many of the symptoms of tuberculosis are due to these poisons as they circulate in the patient's blood.

When Koch first prepared *Tuberculin* at the beginning of the 1890s, he believed that a few injections of the extract would cure the disease. Once again the whole world took notice. Koch's prestige was so great that his announcement of a 'cure' was accepted as a revelation, and every consumptive patient in both hemispheres begged his doctor for the magic remedy. Philip was one of those who hurried to Berlin and came home to Edinburgh with a tiny tube of golden brown liquid.

It is known to-day that the cautious scientist Koch had not wished to make his new *Tuberculin* known to the world until a longer period of research had confirmed its value, but the German Kaiser Wilhelm II was impatient that a new triumph should be claimed at once for the Fatherland and this time the great Koch was proved to be wrong. As a method of treatment *Tuberculin* largely failed. Injected into the tuberculous patient it did not always behave as was predicted, and gradually the tremendous excitement which Koch aroused died away in disillusionment. *Tuberculin*, after all, was not a cure.

Philip, it seemed, was right in his theory that environmental hygiene was more important than medicines. Yet he himself always recommended and used *Tuberculin* to the end of his professional life; he employed it not as a method of treatment but as a simple test which enabled the doctor to discover whether children were infected or not with Koch's germ. *Tuberculin* meant for Philip the secret of tuberculosis control in protecting the child, for its proper use enabled him to find which children needed protection most.

In 1910 some enthusiasts in New York cabled Philip for a message on the tuberculosis problem and received the following reply: 'Watch child as potential tuberculous seedling. Correct faulty compulsory environment and expect forty per cent

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reduction by 1920 and practical disappearance within a generation and a half.'

This bold prophecy has been justified by events. But at home Philip was still considered only a rash enthusiast whose eagerness to be entrusted with tuberculosis schemes rested on a social philosophy that in 1910 no one was willing to accept. The pure physician with his stethoscope his drugs and his personal outlook, was in the centre of the stage, and he was now expected to cure consumption even more quickly in the new public sanatoria which Mr. Lloyd George promised to build all over the country as part of the National Health Insurance Scheme of 1911.

Before following the effect of this development upon Philip's career, we must go back to the development of Boddington's open air idea after it had been revived by Brehmer and Dettweiler and the sage of Nordrach. This unfolding is really the romantic story of the American Edward Livingstone Trudeau, whose interest in tuberculosis goes back a few years before that of Philip, and is inspired by a different motive. For all time Trudeau is the saint of tuberculous patients.

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THE FOREST HEALER

Trudeau's ancestry was French on both sides, and his father, a doctor in New Orleans, was a personal friend of J. J. Audubon, the great painter of birds. These two mental influences — the clear cool thinking from France, and a love of natural history, were the great unconscious forces which enabled the young Trudeau to carry out his absolutely individual role.

He can have had little presentiment of the work he was to do in life when he married a young wife and settled down in New York as a general practitioner, with a three-year lease of a

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house, and the prospect of professional success and modest fame. Both he was to achieve, but in a totally unexpected manner.

He began to suffer from overwork, and was worried by feverish attacks which were put down to malaria, a common feature of metropolitan New York life in the seventies of last century. He consulted a physician — ailing doctors have no more insight into their own sickness than other patients, sometimes less — and with horror, Trudeau heard that two-thirds of his left lung were affected by consumption. In 1873 this was a sentence of death, with stay of execution for one year at the most.

Trudeau was recommended to keep in the open air and go in for horse exercise. He was dazed, and for the time quite irresolute. Trudeau was not a man much given to intellectual pleasures and this brake on his sporting activities opened to him a terrible prospect. In this extremity his fancy flew back to the place where he had been happiest.

With Trudeau every sort of wild animal life was a passion. He remembered happy days in the woods, with dog and gun, and now, faced with a sentence of lingering death, he made the practical decision to spend his last days recapturing happiness in the great forest north of New York, where the Red Indians had hunted bears and deer beside great lakes and tall trees, the country of Fenimore Cooper and his Mohicans. There at Paul Smith's hostel he would find peace for the last year, or year and a half, which were the most he could count upon.

With dark looks, the doctors consented to this piece of folly, thinking that the poor fellow could not last long, and even the inaccessible Adirondack wilderness would not make much difference one way or another.

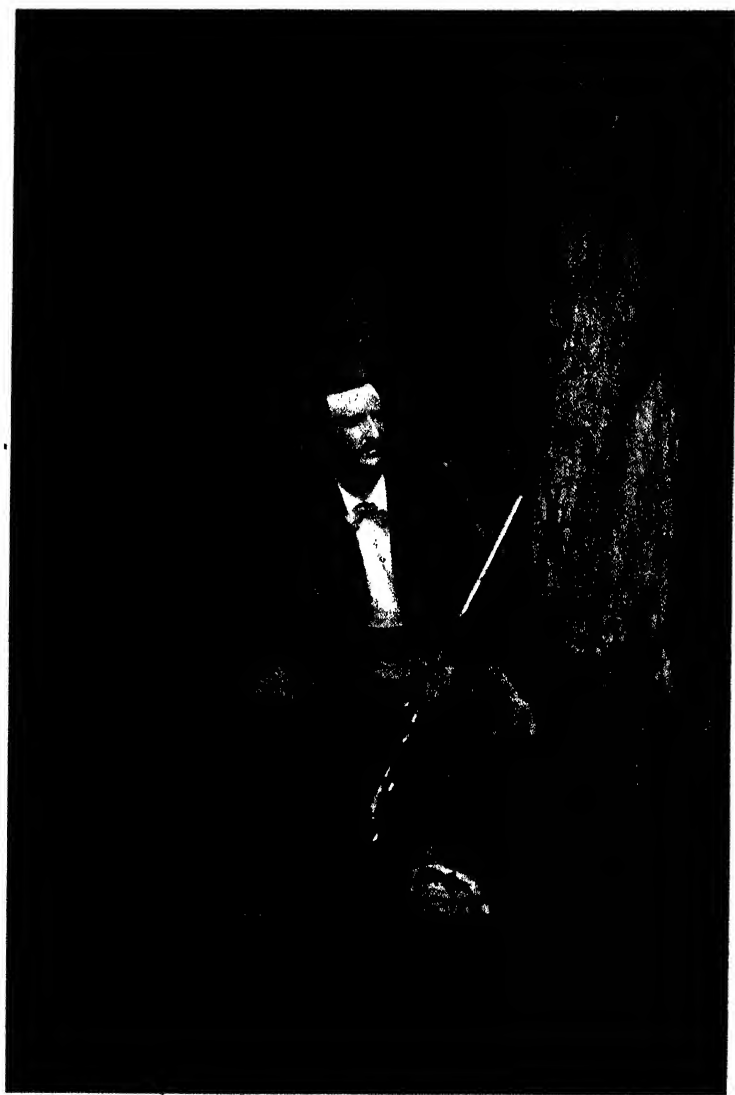
Still feverish after travelling, Trudeau reached the log-cabin hotel, and the robust guide who carried him upstairs to bed said jocularly: 'Doctor, you don't weigh no more than a dried rabbit skin.' Trudeau settled down and began to enjoy the summer that was to be his last. Gradually, after a rest, the

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invalid felt better, and went out each day with the guides, fishing and shooting, whether he was feverish or not. The summer months passed and with the fall of the year came the question of his return to New York or some equable climate more beneficial for consumptives. But Trudeau felt he could not tear himself from the wilderness.

The stillness of the forest, the great lake shimmering in the sunlight, those splendid men the guides and trappers — everything whispered that he must do the unheard-of thing, and stay on through the snowbound winter, sixty miles from doctor or railroad, in a situation then more remote than Alaska is to-day.

So he stayed among the snows, and managed to get through that first Adirondack winter. Next spring, the New York specialist who first diagnosed Trudeau's disease said that his lung was at least no worse. So Trudeau returned to his happy solitude, and the hibernation in the Adirondacks which shocked medical ideas was repeated for nearly fifty years. The consumptive Edward Livingstone Trudeau outlived the doctor who had shaken his head over the first diagnosis, he outlived the husky forest guide who carried him upstairs, he was to outlast his own son and daughter and practically every associate of the first winter. But this is to anticipate. Trudeau's resistance to disease drew power from the fact that his life was not devoted solely to saving his own life. When he realized he could live healthy as well as happy in the forest, he began doctoring among the summer visitors who came to Saranac Lake. Next year a few consumptives came from New York, and some of them decided to brave the Adirondack winter as he had done. So that before long an invalid colony grew up. During the summer Dr. Trudeau found that his medical round now absorbed more of his time than did the rod and gun, but when winter came, with the snow deep and thick, and every green branch was powdered with silver spangles, he resumed hunting the huge white hares with hounds under the white laden evergreens. Trudeau lost his cough, his fever subsided, and he put on weight. He had mastered the great lesson which every



EDWARD LIVINGSTONE TRUDEAU
THE HUNTSMAN

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tuberculous patient must learn if he is to be successful in overcoming his disease. He said, 'I have had ample opportunity in the past forty years to get used to illness and suffering: but it took me a long time to learn, imperfectly though it be, that acquiescence is the only way for the tuberculous invalid to conquer fate'. Acquiescence the way to conquer fate — that was the interior method of treatment carried on within his own soul.

But so far there was no organized sanatorium treatment for those who came to seek health at Saranac Lake. They were just a few individual invalids living in wooden shacks to be near Dr. Trudeau, and he now applied his mind to giving others the precious gift he had found there.

In a medical journal Trudeau had come across what Brehmer and Dettweiler were doing in Germany, and blending their ideas to his own personal experience, he conceived the idea of building a few cottages where poor patients from the cities could remain under his care. With characteristic optimism, Trudeau began to beg money for his new institution and soon he was able to secure a site in the wilderness for his first sanatorium chalet. It was characteristic of Trudeau to choose a location he personally loved — 'My favourite fox runway'. In that spot he knew from experience there was shelter from the prevailing winds, and there was erected the first wooden, scarlet-painted cottage, afterwards famous as 'the little Red'.

It was a modest affair of one room, holding no more than two beds, with an outside porch, seeming to-day absurdly primitive and antiquated. Such was the first sanatorium hospice in America, and it was succeeded by further cottages donated by richer patients, or willing victims of Trudeau's begging. Larger buildings soon grew up all facing that incomparable view of lakes and trees, which was the impressionable Trudeau's first thought in placing the sanatorium in just that place which never failed to give him pleasure, and where the prospect has consoled thousands of tuberculous patients ever since. This artistic pantheism, inherited from his father Audu-

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bon's friend, was Trudeau's surest inspiration. As a physician, he was surpassed by many others, but no one had a sounder instinct upon the powers in nature that can heal the toxin-ridden frame and give hope to the urban exile and the sufferer from city malaise.

Yet Edward Livingstone Trudeau was no mere 'health resort' doctor; he was a scientific physician who somehow managed to plumb the healing depths in the personality; what the forest had enabled him to do for himself, he managed to pass on to others. First he had exploded the fear of the wilderness and had shown the virtue of rest in the cool fresh air. But he kept up with what the scientific world was doing, and in his deceptively amateurish style he saw that each new feature of diagnosis and treatment was adopted promptly at Saranac Lake.

When Koch discovered the *Tubercle Bacillus* and roused as little interest in New York as he had done in London, Trudeau, like Philip, perceived that this was something more than a scientific curiosity, and presently, alongside Trudeau's cottage at Saranac Lake there grew up a wooden shed where the doctor kept his microscope. Here he doctored his glass slides to show up the scarlet-stained germs, and grew them as colonies in tubes of jelly. Here he spent hours over translations of the scientific papers that were being written in Europe. Alas, one day the oil lamp of his incubator set fire to the bench, and in an hour the first sanatorium laboratory in America became a heap of ashes while Trudeau happened to be away on a visit. But such a setback made no more impression on Trudeau than his original misfortunes. He performed the Phoenix trick, as Sir William Osler put it, and before long the staining and examination of specimens was resumed in a new laboratory of granite and mortar which is now a centre of research.

He himself seemed indestructible, and slowly over the years his methods of treating the disease were evolved out of his personal successes and failures. Being in charge of a colony of consumptives required prompt decisions and consummate generalship, for often in these early days the nurses would

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desert in a body at the sight of a haemorrhage; advanced cases flocked in from all over the States and died on Trudeau's doorstep and the beds available in his little huts were never numerous enough for the dozens of human wrecks who wished to stay.

Trudeau's most illustrious patient at Saranac Lake was Robert Louis Stevenson, who has for long stood as the perfect type of the romantic consumptive. He had already tried treatment in Switzerland, but he found more comfort with Trudeau's guidances in the Adirondack Valley, where he spent the whole winter of 1887 and wrote part of the *Master of Ballantrae*. Stevenson knew all the febrile vacillations, the ebb and flow of bodily strength, contrasted with the sublime hopes which are characteristic of tuberculosis, and he will always remain the picture of consumptive genius. Yet it is now open to doubt whether he ever suffered from tuberculosis at all. Certainly Trudeau's private opinion was dubious, and one more mystery is added to the complex fascination of Stevenson's career.

More huts at Saranac Lake, more pavilions, laboratories, a library and finally a school of clinical studies, such is the splendid growth of Trudeau's work during his own life and the quarter of a century since he died internationally famous as the leading exponent of the sanatorium idea. The clearing in the forest has become a bustling town, where five- and ten-cent stores and macadamized roads have taken the place of Trudeau's fox runs. The hills and forests are there still, but gone is the romantic solitude and the glamour of the wilderness. There has been a change too in the nature of the disease to which Trudeau dedicated his life at Saranac. Its treacherous nature and long course are more understood, and modern surgery, proceeding on lines which he dimly foresaw, has been able to aid and accelerate those natural cures initiated among the pine trees.

Trudeau is the saint of the international tuberculosis community, that company of unwilling devotees in every land, firmly bound together by mutual experience and a common

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ritual of rest and hygiene. He showed how far the open air notion could be developed, though his own experience of treatment was limited to one locality, and he was more interested in the cure of a single invalid than in world-wide systems. The handling of individual tuberculous patients must always be a very personal art demanding much patient insight. D. H. Lawrence puts into a sentence the whole psychological background to this disease in his lines: 'I am ill because of wounds to the soul, to the deep emotional self, and the wounds to the soul take a long time, long time, only time can help.' The world needs its understanding healers like E. L. Trudeau, though to-day the methods which Trudeau perfected at Saranac Lake are used everywhere, and it is no longer necessary to travel hundreds of miles to find a sanatorium to give him hope.

This change is in large part due to the entirely different and more broadly constructive genius of Robert W. Philip, whose opportunity came when Lloyd George brought his National Health Insurance Act to an unwilling England in 1911.

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THE ORIGINAL CLINIC

In exchange for his weekly contributions, represented by those stamps on a card which in that year were almost as great an innovation as Health Insurance itself, the tuberculous man or woman acquired the right to be treated in a sanatorium. Yet apart from a few pioneer institutions, of which Philip's Victoria Hospital in Edinburgh had been the earliest, there were hardly any sanatoria where the consumptive hundreds of thousands could go. Mr. Lloyd George had put over his scheme upon the unconvinced doctors, and he could not afford to have thrown back in his face his over-optimistic promise of a residential paradise for every tuberculous patient. Like the idea of Health

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Insurance itself, sanatoria came from Germany, and we might have had a chain of them on every mountain-top throughout the land. It was fortunate that Philip happened to be a member of the Government Committee under Mr. (afterwards Lord) Astor which created the official tuberculosis scheme to back up the Chancellor's promise.

Philip was the only member of that body who had real experience of a practical plan. His Edinburgh Dispensary System, now twenty-five years old, was handling the children of the earliest patients, and he had proved over and over again that a remote sanatorium on the hilltop was not sufficient. The tuberculosis dispensary had to be situated near the homes of the people, and the purpose of his work was fundamentally sociological as much as medical. Happily the Astor Committee became convinced of Philip's point of view. The Edinburgh scheme was the model they chose and so instead of isolated sanatoria, on the German or the Saranac Lake model, a dispensary or clinic was the hub of the wheel, and Philip's original idea, in its full detail, was henceforth official policy.

About this time, thirty-two pupils and friends from all over the world had collaborated under the guidance of one of Philip's disciples, later even better known as an author. This was Dr. Halliday Sutherland, who edited a volume of essays praising the dispensary and its creator. Even to-day this tribute has force, but in 1912 it was the revelation of a new idea, the beginning of social medicine. An admirer placed the book in the hands of the Prime Minister's wife, where it did its work, and the originator of the dispensary was dubbed Sir Robert Philip.

Everyone had now the right to claim treatment in one of these dispensaries, once his doctor had notified the Health Authority that he was suffering from tuberculosis. From the earliest days of his dispensary Philip had been a pioneer in notification, and pressed this idea upon the Government for many years before it became law in 1912. Out of this simple procedure has come the whole modern tuberculosis scheme in

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which Britain has shown the way to other lands. The tuberculous person and his family are looked after, by the doctor, the medical officer of health, and the almoner. He is treated free and his family maintained by the State, and the social recognition Philip fought for has been largely achieved. In Britain, despite two wars, the tuberculosis problem is in course of being solved, but in Africa and Asia its full importance has hardly yet been realized.

Philip, the private physician who at heart mistrusted governments, was now in the situation of one who, having fought for something all his life, is lost when his object is gained. One day a dispensary patient summarized his own case as follows: 'Well, sir, it was like this. I filled up a form and I entered an institution.' Upon which the great individualist Philip commented: 'Filling up forms — entering institutions, it's the humour of the age.'

He had invented the social outlook upon tuberculosis, but he was not afterwards entirely happy with its bureaucratic consequences. The wine of his experience would not mingle with the water of public control.

The humour of the age, yes — but the age which favoured municipal medicine had to be humoured and so, like a working model, the whole dispensary set-up, with its clinic, sanatorium, farm colony and great reputation was handed over to the city of Edinburgh as a gift, and the first specimen of a health clinic became public property.

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The third and most splendid part of Philip's career now begins, after the end of the first world war. He had mastered the art of presenting his idea. Sir Robert Philip had become an international figure and his critics said he behaved as though

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tuberculosis were his own invention. Certainly, his manner was proprietary, and he patronized everyone who showed the slightest interest in his chosen subject. People were willing to respect a man who claimed to have solved the ancient riddle of tuberculosis, and he now spent his time attending international conferences, where he was an incomparable representative, expert in the formula and committee cliché. Though he always advised others that their public speeches should be brief, his own were usually long, because he had much to say. He was genial, pompous, and his words had a hypnotizing effect over a group of people. He liked to carry out his social ideas through admiring laymen who would deferentially forward them without needing to comprehend. 'Lord So-and-So is a good fellow — most willing to be guided', was a characteristic Philippian phrase. '*Willing to be guided*' — that expressed his attitude towards these necessary but mystified instruments of his policy. Not theirs to reason why, but to accept the pure gospel from his own guiding lips. At a meeting his grey eyes seemed to read the minds of everyone in the room, as, with an occasional gesture of the eyeglass held on black ribbon, he poured slow measured phrases over their minds like softly-falling snow and obliterated their previous ideas. His followers were frequently bewildered but they continued to follow.

He had now developed a fastidious style of living, and he enjoyed food and wine in a rich and very didactic way. By middle age his summer visit to Pontresina and winter trip to Mentone had become a fixed schedule. This serious-minded man liked to give the impression of a certain worldliness, suggesting the golden Edwardian age, with gay lunches at Romano's and beauties in large hats.

Sir Robert Philip could compose a menu as well as a prescription, and organize a banquet as efficiently as a medical dispensary. No matter how busy, he would sit down each day to an excellent luncheon which became stereotyped through the years: grapefruit sprinkled with pure vermouth, the mutton ragout or fish, a glass of light French wine, the Stilton cheese,

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the cucumber, followed by strong coffee which he always made himself, while not disdaining to deliver a practical lecturette on the art of making good coffee. Then came the cigar and any proposal to pierce the butt of the cigar would receive his shocked remonstrance, as pointing out the smoothness and perfection of that rounded end he would say solemnly: 'Let us not destroy what the labour of countless generations has gone to perfect.' As he withdrew from a room, no matter where, the window was ceremoniously opened with the air of ritual, that ritual practised for half a century.

He loved to score over people, he liked flattery, however gross, but was not deceived by it, and though his own wit did not soar, he could appreciate subtlety, and was inspired at penetrating people's character. Philip enjoyed an elaborate intrigue, made a mystery of his everyday movements and always rowed towards his objective with muffled oars. His aims were simple, but his methods of obtaining them exceedingly complex. Altogether a many-sided man, when in 1918 he became the first Professor of Tuberculosis in Britain. A de Laszlo portrait of him at this period shows him in academic robes with a ground plan of the dispensary scheme on his knee glancing shrewdly over his shoulder as though sensing the reaction of an expectant audience, and ready to quell all objections with superior argument.

Sir Robert Philip continued to give public guidance in numberless addresses, always planning like the general of a campaign. Indeed, this was his mental picture of himself — a commander-in-chief of the forces arrayed against tuberculosis. He drew up and announced the grand strategy: 'One leaves the details to one's lieutenants' was his favourite phrase, but in practice his assistants soon discovered that the Commander-in-Chief had settled everything down to the smallest detail, and there was nothing for them but to be obedient instruments. His own vitality absorbed theirs, and his absolute autocracy in the trivial as well as the important was concealed behind a smoke-screen of sweet reasonableness. What some people took to be

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his vanity was really Philip's profound sense of occasion, a tribute to the great cause and himself as its leader.

A new sanatorium was opened on the outskirts of Edinburgh, and with a herd of tuberculin-tested cows, and another herd of experimental guinea-pigs, Philip demonstrated once more that tuberculosis, whether in man or animal, was a single disease. If then it could be eradicated from a herd of Ayrshire cows, why not from the whole human race? He was incapable of seeing an issue in a parochial way, but lifted each problem to the universal, and laid down laws in grave Philippian language. His speeches were statesmanlike, his letters resembled Papal bulls in which he dramatized the human conflict against tuberculosis, acting the great leader in every pronouncement.

To some he seemed tiresomely pompous, but that was a role which he felt the situation required. Here was a disease destroying millions of lives every year. Tuberculosis menaced every family so long as it threatened one single human being. The Edinburgh Dispensary System had proved that this treacherous disease could be eradicated. Philip believed in ceaseless warfare and he believed in his own mission to kindle people's hearts and keep up a sleepless resistance. How could the world hesitate for a single moment to do what was required? 'Bless my soul', he would exclaim with kindly indignation, 'one has pointed out the way for forty years, why don't they understand the big issue?' Only a man who took his call seriously could have acted that part, and one who had been the acknowledged leader of the anti-tuberculosis campaign for forty years may be pardoned for feeling that now the whole world was looking to him. He enjoyed the great movement, the larger issue, the oecumenical, the world-wide. He was so cautiously diplomatic, such a master of the vague and allusive, and he could hardly commit himself to the simplest statement without devious qualifications, so that it is not surprising that he never wrote the great book on tuberculosis that would have handed on the Philippian oracle.

He lived more than forty years in a dignified Adam house in

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Charlotte Square, Edinburgh, and two generations of tuberculous invalids waited anxiously among the Academy paintings of his dining-room, and were reassured to find, when taken into the presence, that the great specialist was an old gentleman like a kindly round bear, who sat behind a Louis Quinze writing-table in a room ornamented with antique porcelain jars which the old physicians used for their leeches and simples, and, like theirs, his advice was encouraging and practical.

Yet Philip was not greatly sympathetic to his individual fellow-creatures. In his manner there was always a trace of superiority and benevolent impatience towards the ignorance, the slackness, of the ordinary man. The individual patient rather displeased him by being ill. If only — he seemed to feel, when some pathetic invalid's case was put before him — bless my soul, if only this man had been better guided, had come earlier to the dispensary, if only his doctor had been trained to recognize the earliest manifestations — ah, if only the world had been more inspired with the Philippian ideal. It was all so unnecessary, and he hated such waste as much as Bernard Shaw hates poverty. Philip wanted to be above the trivial management of the individual illness, and do the Lord's business by attending to the larger cause. Philip himself had sound health and until the age of eighty a sound digestion, and his successful career was attended by the minimum of difficulties. He had married, in turn, two vivacious Irishwomen who gave material and moral aid to the great cause, yet in the latter part of life he became imprisoned in his own remoteness. His senses of sight, hearing, taste and smell were unimpaired, and his mind functioned to old age without any loss of faculties. Philip knew how Irish stew should be cooked and wine served, he loved flowers and gardens, and his life was conducted with tasteful elegance. In old age those great mental powers were increasingly exercised on trivial formality and elaborate moves in a lonely game, as though he were playing a match with the past.

In his great address as President of the British Medical

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Association in 1927 he told the assembled doctors that their calling was to encourage positive health and not merely relieve symptoms, and he was one of the first great physicians to spread an idea which now expresses the fullest medical aspiration of our times.

The remarkable fact is that Philip's ideas were usually correct. His Dispensary Scheme of 1887 is still the basis of the communal attack on tuberculosis, and in all essentials is unchallengeable; it can be carried out as successfully in Lagos or Singapore as in Edinburgh.

How different was this man and his well-ordered life from the invalid, impulsive Trudeau, whose eye was never far from the sight of a gun, and who cared more for the handful of consumptives lying near his favourite fox run than all the medical organizations in the world; that little rabbit of a creature, with the triangle of dense whisker on each cheek, who was essentially a bit of primitive nature and seemed always surprised by his own worldly success!

Towards the end, Philip immersed himself in the diplomatic aspects of medicine. He could have been a superb medical statesman, but on account of age he regretfully declined an opportunity to go into the House of Commons, and for the same reason refused the offer of a University Chair of Preventive Medicine which was to be created specially for him. The technique of another departure in medicine was not for him at the age of sixty-five. He was a great natural politician, and if he could have made his speeches as lively as his private talk he might have been a parliamentary influence.

His hope of the future lay in his students, for whom he exercised a great fascination, as is shown by the tales which gathered around him. As for instance, the advice he gave to them in their final year. The professor's nasal voice droned deep, his mien portentously serious, and as he thrust out two middle fingers to emphasize his point, they heard in a vacuum of reverent silence the slow, measured words, uttered like an incantation. 'Some may say to you — cultivate a bedside

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manner. That, however, is not my advice. When you go to your patient, *be your natural selves* — laying aside all pomposity and affectation.' It was good advice but, like many of Philip's utterances, was misunderstood because of the portentous manner of its delivery.

No words can reproduce the solemnity of that speech and there were no smiles on the faces of the students, just respectful homage. '*All pomposity and affectation!*' they repeated when released from the presence, few failing to realize that the man who gave such counsel, however unconsciously, would remain to the end of their lives the prime embodiment of those qualities.

When the Royal Victoria Hospital was opened, the wits noted that certain pipes on the outside walls of the building bore the initials R.W.P. When asked to explain the meaning of this, Sir Robert W. Philip replied magisterially: 'Some may think those initial letters were placed there in commemoration of one's own link with the institution. The real explanation, however, is more practical. They signify *Rain Water Pipe!*'

Until his eightieth year he was to be seen every day, a short, stoutish man with a large head, strutting energetically, though with dignity, across Charlotte Square, Edinburgh, bending his body forward at each step. He wears a bowler hat far back, and his rather long jacket, black stock necktie, light gloves, and buttoned boots proclaim the dandy of thirty years before. He holds his stick like a crozier, and enjoys his cigar on the way to his lecture at nine o'clock in the morning. He has delivered that address very often before and it has expanded in the years. In fact it has become a course of thirty lectures extending over the University session. The simple story of tuberculosis is now a whole syllabus told in Philippian language. He is not a vivid or inspired lecturer, and his 'cello-droning voice is apt to be soporific even at nine o'clock in the morning, but he hypnotizes the students with a kind of awed sense that they are listening to history from the very man, the successor of Laennec and Boddington and Robert Koch, who with E. L. Trudeau personifies modern man's struggle against tuberculosis. The

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disease had been known since Pharaohs carried vestiges of it to their tombs, but only in this man's day had organized resistance become possible, largely through his efforts. He gave these disciples the sense of certitude, and they felt themselves part of the stream of medical progress.

A second world war has shown us the folly of some judgments we used to accept, but Philip's work will stand, a monument to persevering thought and example. The disease had plagued humanity since before the Pyramids, yet he was the first to introduce a practical method of preventing it.

Is it derogatory to say that he used the methods of a religious leader to further his aim of the conquest of disease through the attainment of health?

PART SEVEN

EPILOGUE:

REMBRANDT'S PICTURE

REMBRANDT'S PICTURE

WEARING his high-crowned black hat, Dr. Nicolaas Tulp reads a dissertation upon the muscles of the dead forearm. Listening with rebellious intensity are the embryo doctors of all time, critically accepting, reverently differing. Watching such a demonstration in their student days, our five favourites in this book stand by, each thinking his own thoughts.

There with vehement eyes is John Elliotson, convinced he is in contact with a spiritual world as yet unknown to medicine as life is far absent from that corpse. The peppery little Hugh Owen Thomas watches, testing each phrase upon the grindstone of his own scepticism. James Mackenzie gazes on mournfully, muttering that authority was for a thousand years the death of healing, but that this cocksure anatomist is at least one stage better than the ignorant Galenists who thought they understood the human body when all they knew was the carcase of a pig. Towering at the back, majestic and self-confident, William Macewen seems to say that dead anatomy is not enough, but that one must find out how the bones grow, and to that end he has planned private research. Robert W. Philip watches disdainfully, knowing that it is not a few simple dissections that make the physician, but a broad theory, a philosophy, an evangelistic faith.

Their faces show a tumult of thoughts, yet they listen to an anatomy lesson such as the Dr. Nicolaas Tulps have given to every generation. Each of them has his private scepticism as an armour for his integrity, but he also has the faith. They differ, and each of them is right. They represent five separate philosophies, each one true. Armed with his own belief, each has thousands, millions of allies among the sick.

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